LITHOGRAPHIC ABSTRACTS
1947

Monthly Lithographic Abstracts
June 1946 Through June 1947

OGRAPHIC TECHNICAL FOUNDATION, INC.
131 East 39th Street, New York 16, N. Y.

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131 East 39th Street, New York 16, N. Y.

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LITHOGRAPHIC ABSTRACTS 1947

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I. PHOTOGRAPHY, TONE AND COLOR CORRECTION

1. Process photography—general

HALFTONE PHOTOGRAPHY FOR OFFSET LITHOGRAPHY. *Lithographic Technical Foundation*, **131 East 39th Street, New York 16. Shop Manual No. 24, 25 cents. An elementary discussion of halftone photography for black and white reproduction. It covers the camera and darkroom, the halftone and contact screens, and the photographic operations in making halftone positives. Defects in the product are listed together with causes and remedies.**

***TECHNOLOGICAL PROGRESS.** Ernest E. Jones. *Printing Equipment Engineer* 73, No. 1, October, 1946, pp. 42-3 (2 pages). Progress in photo-mechanical processes is summarized. Research and development work is still continuing. Plastic, new types of glass, and even lenses made from steel will be great improvements over those now in use. Halftone screens that make a line and halftone combined simply by changing filters, contact screens, and mezzograph screens all have a place in the reproduction process. Various diaphragm controls are described and it

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is pointed out that, although these controls are a great aid to a photographer, still a densitometer is almost a necessity for correct balance of color with the various filters. Progress is being made on camera lamps which will correct the majority of the faults of present lights. Electronic light control meters, mechanical masking for color corrections, the use of fluorescent water color paints for color reproduction, and color films are also mentioned.

2. Photographic materials

SHRINKAGE TEST OF PHOTOMECHANICAL FILMS. Edward Colton. *PB Report 7502*, 1944. 3 pages. (Army Air Forces, Eng. Div. TSEPL-4-680-62-14). Price: Microfilm, 50c—Photostat $1.00. There was no significant difference between the percentage shrinkage of the low shrink and regular base photomechanical films of either Eastman Kodak Company or Ansco Company. *Bibliography of Scientific and Industrial Report* 1, No. 14, April 12, 1946, p. 705.

Polyurethane Used as Binding Agent for Light-Sensitive Substances. I. G. Farbenindustrie. "French Patent No. 881,779" (May 5, 1942). As a binding agent for light-sensitive substances of all kinds, polyurethane is used. Such layers may be used without a special support, such as glass, paper, or film. The combination of the light-sensitive substances with the polyurethane can be effective in any desired manner, for example, by mixing in a melt, by impression, by diffusion and subsequent precipitation, etc. "Kodak Monthly Abstract Bulletin" 31, No. 12, December, 1945, p. 405.

* GIVE YOUR PRINTS A SCRATCH-PROOF CELLOPHANE SURFACE. *American Photography* 41, No. 3, March, 1947, p. 48 (1 page). Directions are given for covering prints with cellophane to give them a virtually scratch-proof surface, protecting them against all ordinary wear.

3. Collodion emulsions

*TECHNICAL PROGRESS IN GERMANY (PHOTO-LITHOGRAPHY). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 54, No. 639, March, 1947, p. 78 (1 page). Reports from Germany indicate an extensive use of collodion emulsion for negative making. Negatives made by this process in Germany are remarkably free from defects and have excellent quality. The emulsion is made by Freundorfer and consists of silver bromide suspended in collodion, and it is sensitive to blue, violet and ultra-violet. The method by which this emulsion is color sensitized is described and a process is suggested for using this emulsion for direct screen color-separation negative. A German apparatus for making color separation negatives from 35 mm. color transparencies is also described.

* COLLODION EMULSIONS. J. S. Mertle. *Modern Lithographer and Offset Printer* 42, No. 12, December, 1946, pp. 223-224 (2 pages). The use of collodion emulsion is compared with the use of dry plates with regard to economy, manipulation, and exposure. It is pointed out that collodion emulsion has considerable practical value but where uniformity and full control are called for gelatin dry plates should be used.

4. Film processing

*CONTROLLING THE DENSITY OF NEGATIVES. Phil Shakespeare, Jr. *Lithographers' Journal* 31, No. 5, August, 1946, p. 291 (1 page). The first requisite for proper control of the density of negative is proper exposure so that negative can be developed for the full time at prescribed temperature. D-76 is recommended as a good all-round negative developer. Factors involved in determining length of time required for development are discussed. The importance of correct temperature for the developer and other processing baths is stressed. Suggestion is given for cooling solutions when temperature is too high.

Lithographic Platemaking Apparatus. James T. Campbell. "U. S. Patent" No. 2,412,317 (December 10, 1946). Apparatus for processing exposed film for the making of lithographic plates comprising an insulated support, a temperature controlled sink nested within said insulated support, developing and fixing bath trays supported upon and partially immersed within said sink within a fluid therein, a washing tray supported upon and disposed within said sink with its under surface above the level of fluid therein, a fluid source to said washing tray, a removable stand pipe in said wash tray, a drain pipe extending below the bottom thereof, a stand pipe in said sink, into which said wash tray drain may be removably inserted, and a second drain pipe joined to said sink stand pipe and disposed through said sink and said insulated support for conducting fluid from said wash tray independent of the fluid within said sink. "Official Gazette" 593, No. 2, December 10, 1946 p. 204.

5. Chemical reversal

*CHEMICAL REVERSAL (PHOTO-LITHOGRAPHY). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 54, No. 638, February, 1947, p. 50 (1 page). Details are given for the technique of converting a screen negative to a positive by a chemical reversal method. Reversal of this kind can be effected with certainty in the case of line subjects; requirements are much more exacting for screen work. In screen work it is essential that the dots forming the first negative image should penetrate deeply into the film, so that there will be little residual silver halide behind them, and also that the dots of the positive image should have good density so as to stand up to the subsequent "dot etching".

6. Light sources

*THE CONCENTRATED ARC—A PRACTICAL PHOTOMECHANICAL APPLICATION. G. B. I. Miller. *Modern Lithography* 15, No. 3, March, 1947, pp. 37-39 (3 pages); *Army Map Service Bulletin* No. 25, January, 1947, pp. 8-16 (9 pages). The Western Union Concentrated-Arc light source, and the tests recently made with it by the Photo and Lithographic Branch of the Engineer Board, are described. The results of these tests appear to be unlimited in their application to the photomechanical process of offset lithography.

7. Light control

*PHOTOGRAVURE — EXPOSURE METERS IN THE STUDIO. H. M. Cartwright. *Process Engraver's Monthly* 53, No. 628, April, 1946, p. 101 (1 page). The author discusses the use of exposure meters in the technical studio, with special emphasis on the visual photometer form of exposure

meter designed by Dunn and Plant. One important feature of this instrument is its small acceptance angle, which is stated to be about half a degree, which makes it possible to base exposure on light reflected from the darkest part of the subject as well as to measure the darkest and the lightest parts to find the total brightness range. Other features include the long range of intensities covered by it and its sensitivity which permits readings to be taken in moonlight or in dark interiors. The uses of this instrument in general photography, and in the copying studio, as well as in the technical studio, are considered.

8. Process cameras

***Choosing a Process Camera.** Herbert P. Paschel. "Modern Lithography" 14, No. 4, April, 1946. pp. 39, 41, 43, 45, 99, 101 (6 pages). The selection of the devices for holding the sensitive material and the copy is considered as it is based upon the type of work to be handled in regard to speed, accuracy, and capacity. The soundness of design and construction and the operating advantages of each of the three methods of supporting film and paper negative material — stayflat, vacuum, or sandwiched between two sheets of glass — are discussed. The different types of stayflat, vacuum, plate, double purpose, and multiple holders are listed. Open face copy holders and the glass covered type, and the various available arrangements of each, are also listed and described. Special features necessary for color work are discussed. Sixteen illustrations are given of the holders mentioned.

***Choosing a Process Camera.** Herbert P. Paschel. "Modern Lithography" 14, No. 5, May, 1946, pp. 67, 69, 90, 73 (4 pages). Optional features and accessories which are often overlooked or disregarded in choosing a camera, but which should merit serious consideration are discussed. A calibrated focusing system is a worthwhile investment when choosing a camera. The functions and types of focusing systems are described. The sliding or elevating screen mechanism is indispensable for any camera on which combination line and halftone work, and highlighting halftones by fluorescence process is contemplated, in order to prevent breaking the screen, disturbing the screen distance setting, or causing blemishes in the negative. The disk and sheet or panel types screen compensators are described and the use of each explained. The use of various types of flashing lamps is also discussed.

***CHOOSING A PROCESS CAMERA.** Herbert P. Paschel. *Modern Lithography* 14, No. 6, June, 1946, pp. 45, 47, 49 (3 pages). Certain optional features and accessories on a camera are discussed, among which are various devices which permit infinite accuracy in lens aperture settings. The Robertson, Kinzler, Wesel, and A.T.F.-Long controls are specifically mentioned. The arc-light carriage which connects a pair of arc-lights to each other and to the copyboard at a fixed distance and angle is the solution to the problem of variation of light strength reaching copy. The three basic types are discussed. The Hurletron, Totalux, Gelb, and Luxometer Exposure Controls are capable of controlling a pre-determined light-time cycle in accordance with the strength of the illuminant. The teamwork of devices for best results is also discussed. A number of these instruments are illustrated.

Camera. William C. Huebner. U. S. Patent No. 2,406,770 (September 3,

1946). In a camera of the character described, comprising a carrier supporting a sensitized plate, and a copy carrier, and a lens carrier with a lens disposed approximately vertically and in planes parallel with that of the sensitized plate, the improvement which comprises an overhead rigid monorail extending lengthwise approximately parallel with and in the vertical plane of the axis of the lens from which rail said carriers are suspended and on which said lens and copy carriers are adjustable along the rail, supports disposed at spaced points lengthwise of said monorail by which said rail is resiliently supported, independent tension means for each of said adjustable carriers, and means with which said tension means cooperates in any adjustment of said carrier to exert a resilient downward tension on the carrier in its various adjustments. Official Gazette 590, No. 1, September 3, 1946, p. 66.

Process Camera. S. N. Wekeman, assignor to Sun Chemical Corporation. *U. S. Patent No.* 2,402,107 (July 27, 1940). A process camera is disclosed, including two sets of supporting rails at right angles to each other for direct copy, or for reverse copy through a prism. Means is provided for sliding the copyholders in their own planes for different focal adjustments of the camera, and the camera is provided with a multiple compartment back which slides at right angles to the camera objective to position sensitized material, screens, and the like, on the axis of the objective. *Monthly Abstract Bulletin of the Kodak Research Laboratories* 32, No. 12, December, 1946, p. 444.

*PHOTO-MECHANICAL REVIEW. J. S. Mertle. *National Lithographer* 53, No. 8, August, 1946, pp. 32, 73 (2 pages). The design and use of the lens scale incorporated in the Robertson system of camera scaling are discussed. Ralph Grenell was the first to design a slide rule expressly devised for the requirements of halftone photography. This rule, named the Halftone Calculator, is described. Also discussed are the halftone slide rules invented by Frank H. Smith and J. Warne.

9. Lenses

*LENSES. J. S. Mertle. *Modern Lithographer and Offset Printer* XLII, No. 3, March, 1946, pp. 50, 52 (2 pages). The author tells how to choose and use the correct lens for monochrome and color work. It should be remembered that a process lens is primarily for copying and therefore the optical corrections are directed more to same-size images than to distant ones, as in ordinary lenses; also the lenses are used at relatively small apertures—seldom larger than F. 11. For black and white work, a lens of comparatively simple optical design can be used. For color work many additional characteristics must be introduced to ensure that each color is brought to focus at the same plane. Also discussed are: relation between definition and aperture, anastigmat and apochromat lenses, relation of lens to plate, and an infra-red technique developed.

*COATED PROCESS LENSES. *Modern Lithography* 15, No. 1, January, 1947, pp. 33-34 (2 pages). This article is made up of excerpts dealing with coated lenses from the recent convention of the National Association of Photo-Lithographers in Washington. Generally, the feeling seems to be that: improved coated lenses will be on the market soon; benefits from coated lenses include reduction of flare and improved transmission, as well as

sharper definition. One difficulty mentioned is that, after a period of a year or two, the coating may gradually deteriorate within a few months' time until it is worse than before it was coated. It was mentioned also that the lenses which are coated during manufacture are more likely to accept a more durable coating than those which are coated later.

• PHOTO - MECHANICAL REVIEW. *National Lithographer* 53, No. 12, December, 1946, pp. 36, 72 (2 pages). A process lens, recently invented by William C. Huebner, which is capable of laterally reversing negative images on plates and films without the necessity of turning the camera at right angles to the copyboard is described. Lens coating and its application are discussed. The use of modern chemical substances that reduce the surface tension of a liquid and which "make water wetter" is also considered.

Image Reverser for Cameras. William C. Huebner. "U. S. Patent No. 2,408,855" (October 8, 1946). In an optical system for straight line cameras, the combination of a lens barrel, a lens system within said barrel comprising lens elements spaced apart, an image reversing prism disposed between the nodal points of said lens elements and in the optical axis of said lens system, a circular frame rotatable in the barrel in a plane normal to the optical axis of the lens system and having a centrally disposed recess, a mounting for said prism radially shiftable in the recess for adjusting the prism relatively to the said optical axis, and diametrically opposite screws in said circular frame bearing upon said mounting for shifting the mounting. "Official Gazette" 591, No. 2, October 8, 1946, p. 244.

Lens-Calibrating System. C. R. Daily, "J. Soc. Mot. Pict. Eng. 46, May, 1946, pp. 343-56. The author describes a method for calibrating the effective f/-stop value of a cameralens in terms of the light transmitted by the lens. Owing to light losses within the lens, the f/-value determined in this manner will normally be numerically larger than the values obtained from the geometry of the lens. However, stop values based on transmission are of considerably greater value to a camera man than values based on aperture. An interrupted, collimated beam of light falls on the entrance port of an integrating sphere. The lens to be calibrated is centered over the opening and the light output from the sphere measured through a stable a.-c. amplified equipment. A calibration curve is then obbtained for the equipment in which metal plates with holes of known diameters are placed over the entrance of the sphere in place of the lens. The effective aperture of the lens is then denned as the size of opening which will pass the same total amount of light as the lens under calibration. This method avoids the use of secondary standards and should be capable of duplication in any laboratory. "Monthly Abstract Bulletin" of Kodak Research Laboratories 32, No. 10, October, 1946, p. 319.

10. Diaphragm control systems

Photo-Mechanical Review (Diaphragm Controls). J. S. Mertle. "National Lithographer" 53, No. 5, May, 1946, pp. 34, 64 (2 pages). A common feature of practically all modern diaphragm controls is a lens scale or indicator for conveniently setting the iris diaphragm to the different apertures required in photography with halftone screens of various rulings. The Ratiometer Lens, one of the first of this type, and the Douthitt Automatic Halftone Stop Indicator, the first com-

mercial diaphragm control in which the size of the lens aperture was directly governed and indicated by the scale of reproduction, are discussed. Their designs and functions are described.

***PHOTO-MECHANICAL REVIEW. J. S. Mertle. *National Lithographer* 53, No. 6, June, 1946, pp. 44, 92 (2 pages). The Douthitt Diaphragm Control blazed the trail for quick determination of halftone lens stops according to camera extension or scale of reproduction. This control is discussed both as it was originally designed, and as it is now designed. It now consists of four parts—the lens scale, camera scale, camera scale charts, and the rotating flash stop. Special features of this apparatus, the procedure for installing it, and suggestions for its use are discussed.**

*DIAPHRAGM CONTROLS. J. S. Mertle. *National Lithographer* 53, No. 7, July, 1946, pp. 36, 58 (2 pages). The Kinzler Diaphragm Control is described. The similarities and the differences between it and the Douthitt control are pointed out. Also discussed are the diaphragm control designed by Carl G. Johnson, known as the "Direct Stop Indicator", and the lens scale devised by Arthur Fruwirth.

*PHOTO-MECHANICAL REVIEW. J. S. Mertle. *National Lithographer* 53, No. 9, September, 1946, pp. 33, 76, 78 (3 pages). The design and function of the apparatus for determination of the apertures in a 3-stop exposure patented in 1938 by Elwin D. Lehman are described. The main feature centers around the apparatus designed for automatic indication of the various stops. Also discussed is a special type of process lens patented by Alexander Murray bearing on the front of the lens barrel an etched system of graphs wherewith the iris diaphraghm could be set in coordination with the scale of reproduction and with the diameter of the lens aperture in some definite ratio to the camera extension.

*Photo-Mechanical Review. J. S. Mertle. "National Lithographer" 53, No. 10, October, 1946, pp. 43, 82-3 (3 pages). A camera aperture was patented in 1936 by W. F. Richardson to accentuate the contrast of coarse screen halftones for letterpress newspapers. A feature of this invention was an automatically controlled arrangement of diaphragm plates, these forming square apertures of a size correlated to the camera extension. An electrically actuated diaphragm, intended mainly for photolitho halftones, was patented in 1939 by Richard P. Newick and was later changed and improved by R. R. Robertson and introduced as the Robertson Combined Diaphragm, Timer and Arc Lamp Control. The Linzell-Muller device employed no radically new features but was the first diaphragm control specifically devised for color work by photolitho halftone procedure. The Hansch system employed mathematical tables and was also one of the first to employ electronics as an aid in exposure and production of uniform results in halftone negatives.

*PHOTO-MECHANICAL REVIEW (DIAPHRAGM CONTROLS, Part IX). J. S. Mertle. *National Lithographer* 53, No. 11, November, 1946, pp. 34, 75-6 (3 pages). This article discusses the design and use of the following diaphragm controls: the one invented by H. W. Bailey which incorporated mechanism for automatic control of the iris diaphragm; the

Long diaphragm control which was furnished with an arrangement of two electric motors wherewith the lens diaphragm could be set inside the darkroom when operating the control on process cameras of the darkroom type; the Annick device which did not incorporate any radically new features; the diaphragm control offered by the Repro-Art Machinery Company and forming a part of the Three-Way Focusing Control devised for Levy process cameras; and the Stewart diaphragm control which is one of the most precise and intricate offered to halftone photographers.

11. Crossline and related screens

•DIFFRACTION AND DOT-FORMATION. J. S. Mertle. *Modern Lithographer and Offset Printer* XLII, No. 6, June, 1946, pp. 105-6 (2 pages). The usually accepted principles of halftone negative making are briefly described. The influence of diffraction in halftone negative making is discussed and an alternative approach to halftone theory is advanced, calculating screen distances in relation to the violet wave lengths.

•THE INTERNATIONAL "DUPLEX" SCREEN FOR IMPROVED HALFTONE NEGATIVES AND A PERFECT DROP-OUT PROCESS. Frank A. Grady. *Photo-Engravers' Bulletin* 36, No. 4, November, 1946, pp. 63-71 (9 pages). Among the advantages offered by the International "Duplex" Screen over the conventional screen are: it is not fragile or subject to abrasion, static charge or dust problems; it requires no treatment of the art work; it is a permanent glass screen; it gives a sharper, clearer, greater detail halftone, and improved combination negatives; and it takes the guess work out of drop-outs. This screen is described and instructions given for its use.

Photographic Reproduction Process and Apparatus. Victor C. Ernst, assignor to the Fulton Tone Process Company. U. S. Patent No. 2,414,938 (January 28, 1947). The method of photographically transforming a continuous tone object into an interrupted tone image thereof on a light sensitive plate with a single source of light and an interposed half-tone screen, comprising acting upon the sensitive plate by the light projected through such object and screen by masking the light from said source into a predetermined pattern of a plurality of dots, maintaining the said light source, object, screen and plate in unchanged position and acting upon the light sensitive plate with the light projected through the object and screen masked into a different pattern of dots. Official Gazette 594, No. 4, January 28, 1947, pp. 494-5.

•FLUOROGRAPHIC HALFTONE SCREEN OFFERS NEW SCOPE IN PHOTO-LITHO. Walter S. Marx, Jr. *Modern Lithographer and Offset Printer* 43. No.2, February, 1947, pp. 38, 40 (2 pages). The fluographic half-tone screen is to combine type line, half-tones and highlights in one negative automatically. This is accomplished by removing the opaque material from the rulings in the conventional cross line screen and substituting material perfectly transparent to ultra-violet light but opaque to visible light. The use of this screen is discussed.

•WHY SHOULD PHOTO-LITHOGRAPHERS USE PHOTO-ENGRAVER'S TOOLS? Victor Ernst. *Lithographers' Journal* 31, No. 12,

March, 1947, p. 761-2, 791, 799, (4 pages). The opinion is expressed that the ruled screen was developed primarily for photo engraving, in which a large highlight dot is required in the negative to be broken down to the proper size by etching, and is not as suitable for photolithography as the lenticular screen. The lenticular screen is made up of microscopic lenses angled at forty-five degrees on the screen. Each lens is plano-convex. The optical wedge of a lenticular screen is longer and more gradual. It reproduces all of the tonal values contained in the master continuous tone negative. The procedure for using this screen is described.

12. Contact screens

CONTACT HALFTONE SCREEN. H. C. Alger. *U. S. Patent* No. 2,387,048 (July 18, 1942). The contact halftone screen described has solid black parallel lines or crossed lines superimposed on the graded density elements to act as "gravure" screen lines. *Kodak Monthly Abstract Bulletin* 32, No. 2, February, 1946, p. 69.

13. Copy preparation

*PERFECT COPY FOR THE OFFSET CAMERA. Dan Smith. *Printed Selling*, July, 1946, pp. 10-12 (3 pages). The key to most successful reproduction by offset is to furnish the printer with copy which looks as nearly as possible the way you want it to appear when printed. A few basic principles to follow in the preparation of copy are given. When type is to be reversed the square serif or sans serif faces are best. Good sharp reproduction proofs are essential. *Everything* should be pasted in place on the copy in the exact position in which it is to appear. The special problems presented by halftones are described and suggestions made for their solution. Instructions are given for "keylining," indication of the position of material and a key to whether it reverses, overprints, or should register two or more colors.

* COLOR COPY PREPARATION FOR OFFSET REPRODUCTION. Douglas W. Harris, *National Lithographer* 54, No. 2, February, 1947, pp. 28-9, 85-6 (4 pages). A good dummy is the backbone of planning for any sizeable printed job. The making of a dummy should, if possible, precede the creation of any finished art. This article discusses the following subjects as they pertain to copy preparation: what a dummy should show; choice of art media, variations in photography; print finishes; color guides; handling type and line copy; choice of type faces; mechanical considerations; explanatory notes; and shipping.

14. Retouching and dot etching

* HALF-TONE POSITIVES. Martin Leeden. *Modern Lithographer and Offset Printer* 42, No. 12, December, 1946, pp. 224-5 (2 pages). The comparative value of retouching and dot correction is discussed. It is pointed out that dot etching is very useful in altering large areas of tone, but it is impractical for isolating any area to give a firm, clean edge. If the negative is skillfully retouched the results are better and the work takes less time. The use of retouching pencils, knives, and dyes in retouching technique is briefly described.

*PHOTO-LITHOGRAPHY — DOT ETCHING. A Haigh and H. M. Cart-

wright. *Process Engraver's Monthly* 53, No. 628, April, 1946, p. 106 (1 page). In dot etching, when the positives have received their preliminary general reduction,, it is often possible to effect all the retouching by local reduction with the brush. Large areas requiring uniform dot etching however are best reduced in a bath. The staging procedure is described and two alternative methods of local reduction are presented. Instructions are also given for removing the staging paint, when retouching is complete, and for final fixing and washing.

*Photo-Lithography (Dot Etching). A. Haigh and H. M. Cartwright. "Process Engraver's Monthly" 53, No. 629, May, 1946, pp. 134-5 (2 pages). The best form of training for retouchers with no previous experience of dot-etching is to start with plates which have an all-over joined dot pattern and to execute some simple design on them by dot-etching in the bath and with the brush. The retouching of simple monochrome subjects is considered. Suggestions are given for retouching of the first negative if the reproduction is made by way of continuous-tone negative and then screen positive. Also instructions are given for dot-etching if the screen positive is made from an unretouched continuous-tone negative or screen negative. The use of a knife for putting in fine details and the method of obtaining clear borders are also considered.

*PHOTO - LITHOGRAPHY (DOT ETCHING — COLOUR WORK). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 53, No. 630, June, 1946, p. 162 (1 page). The fundamentals of the 4-colour reproduction process are briefly described. Some of the reasons that additional printings are often used in photo-lithography are enumerated. The selection of screen positives and work done by retoucher on a typical 6-colour scheme are discussed to show the technique and nature of color correction required. Screen angles are briefly touched upon.

*PHOTO - LITHOGRAPHY (COLOR RETOUCHING). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 53, No. 631, July, 1946, p. 190 (1 page). In color retouching it will be found that the warmer colors —yellows, reds, and browns—require much less correction than the colder colors such as blues and greens. The retouching required for reproducing a landscape with six printings is described. The special difficulties presented by portraits are briefly touched upon. Four-color and six-color work are compared.

*PHOTO-LITHOGRAPHY (DOT REDUCTION — ALTERNATIVE METHODS). A. Haigh and H. M. Cartwright. *Process Engraver's Monthly* 53, No. 632, August, 1946, p. 218 (1 page). Alternatives to the usual present day technique of dot reduction with hypo-ferricyanide solutions are described. The use of the Peridak Process and its disadvantages are discussed. One drawback associated with hypo-ferricyanide reduction is the risk of a residual brown image at the edges of the reduced dots. Some retouchers prefer to use iodine and cyanide rather than hypo-ferricyanide for this reason and also because the iodine-cyanide mixture remains active longer. Disadvantages, of course, include the poisonous nature of cyanides and the tendency for cyanide solution to soften the gelatine film. Formula is given for the iodine-cyanide solution.

*Photo-Lithography. A. Haigh and H. M. Cartwright. "Process Engravers' Monthly" 53, No. 633, September, 1946, p. 246 (1 page). Ceric sulphate, as a dot etching reducer, is discussed. Another process of dot etching depends on use of a tanning developer. The Hausleiter "Black" Plate Process is described.

*PHOTO-LITHOGRAPHY (DOT REDUCTION – ALTERNATIVE METHODS). A. Haigh and H. M. Cartwright. *Process Engraver's Monthly* 53, No. 634, October, 1946, p. 274 (1 page). Among the ways discussed in this article in which attempts have been made to provide plates suitable for "dot etching" are the following: processes using a metal base, light sensitive resin process, wet collodion positives, bleached negative process. Some of these processes never got beyond the laboratory stage while others were tried and abandoned, either because of technical difficulties or because they were slow or unreliable.

*PHOTO-LITHOGRAPHY (INTENSIFICATION). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 53, No. 635, November, 1946 p. 302 (1 page). The success of any positive-reversal or deep-etch process depends to a great extent on retaining dots of good density in the positives. Factors leading to the production of dots of high density are proper processing conditions, such as correct screen distance, adequate exposure, and full development. If the smaller dots do weaken, intensification may be necessary. A formula for an intensifying solution using mercuric iodide, and instructions for its use, are given. A method of increasing dot size by intensification with an organic developer plus silver nitrate solution is discussed. The formula for this intensifier and instructions for its use are given.

15. Tone and color correction

*TONE AND COLOR CONTROL. Paul W. Dorst. *Modern Lithography* 15, No. 3, March, 1947, pp. 30-36 (7 pages). The quality of offset prints lies in their tone and color values. Color values in halftone prints consists of tone values in the various ink colors. The control of tones, therefore, is the most important problem in offset lithographic reproduction. The photographer and correction artist cannot predict the results, and thus do their best work, unless operations after tone corrections are standardized with respect to tones. Effective tone control can be achieved only by controlling both dot area and dot density on the press prints. All the conditions that have any effect on dot area or dot density must, therefore, be controlled. These include: type of paper, exposure and closeness of contact in platemaking, plate graining, development conditions, amounts of water and ink, and press conditions. The research being done by the Lithographic Technical Foundation on tone control is mentioned.

*Tone and Color Correcting. Lawrence Brehm. 'Modern Lithography" 14, No. 3, March, 1946, pp. 32, 39, 41, 89, 91 (6 pages). Color correcting and negative retouching are considered as they are performed on the continuous-tone color-separation negative. Nine reasons are given for the preference of making color corrections on separation negative rather than on halftone positive. The author gives suggestions for studying and analyzing the picture before starting correcting work and he stresses the importance of a great deal of training and an inherent sense of color in the greatest degree for the

lithographic artist. Limitations the lithographic artist meets in trying to reproduce the colors and character of the original art work are enumerated and standardization of the process colors is advocated. Choice, use, and value of color swatches are discussed.

*THE MEASUREMENT OF TONE REPRODUCTION OF HALFTONE PRINTS AND UNIFORMITY OF SOLID PRINTS. R. Buchdahl, M. F. Polglase, & H. C. Schwalbe. *Paper Trade Journal* 122, No. 18, May 2, 1946 pp. 41-5 (5 pages). The measurement of tone reproduction quality is based on the assumption that the tone values of an ideal print are identical to the tone values predicted by the printing plate. The actual tone values, expressed as densities, are obtained from the spectrophotometric measurements of brightness. Ideal densities are calculated from the print and non-print areas of the printing plate, and the brightnesses of the unprinted paper and the solid print. The deviation of the actual tone values from the theoretical tone values has been used as the objective measure of tone reproduction. A comparison of this objective measurement with the subjective evaluation of tone reproduction resulted in satisfactory agreement. The uniformity of a solid print is the evenness of the density of the ink film over the total area of the solid. An objective evaluation involves the measurement of brightness and brightness differences of the print. This has been accomplished by photographing the solid and measuring the density values across the negative. The objective parameter, for uniformity, includes the average deviation in density and a measure of the distribution of the density values. This value is shown to agree with the subjective evaluations of uniformity made by several qualified observers.

16. Color—general

Color Harmony Manual. Color Laboratories Division, Container Corporation of America — Manufacturer. "Paper Industry and Paper World" 28, No. 8, November, 1946, p. 1222. The new edition of this manual consists of 12 handbooks containing 680 movable color chips, a work chart, a removable gray scale holder, a twenty-four page illustrated text, and a buckram covered box.

REPORT ON DEFECTIVE COLOR VISION IN INDUSTRY. *Physical Society, Colour Group, London, England, Report A1614.1/713.*, 1946, 52 pp. 3s. 6d. There are many tasks in the printing and allied trades which require reasonably normal color vision for their satisfactory performance, and if more care were given to the preliminary selection of workers, much time and disappointment could be saved. This report deals with the nature and incidence of defective color vision, different tests for color vision, requirements of industry and the Fighting Services, the importance of these tests and the Committee's recommendations. *Printing Abstracts* 2, No. 3, March, 1947, p. 124.

17. Color photography—general

*COLOR PHOTOGRAPHY. Joseph Friedman. *American Photography* 40, No. 11, November, 1946, pp. 44-46 (3 pages). The evolution of color photography is discussed. The findings of Senebier, Seebeck, and Herschel on the action of colored light upon silver salts, and some of the early color photographic processes based on this re-

action are discussed. These processes were very direct, involving a single layer of sensitive material, a single exposure in the camera, and a simple after-bath to destroy the sensitivity in the unexposed regions. However, success with this process was the exception rather than the rule. Although at this time 3-color printing was fairly well established it was some time before its marriage with photographic methods for the preparation of printing plates. This rather complicated procedure, involving 3 exposures, and subsequent registration of three images has but in the last 10 years started giving way to more simplified processes again. Psychological, as distinguished from physical color, is discussed.

THE FUTURE OF COLOR SEPARATION. D. A. Spencer. *Paper and Print* 20, No. 3, Autumn, 1946 pp. 141-2, 144, 146 (4 pages) or *Modern Lithographer and Offset Printer*, Part I, Volume 42, No. 7, July, 1946, pp. 126, 128; Part II, Volume 42, No. 8, August, 1946, pp. 143, 144 (4 pages). The theory of 3-color reproduction is reviewed briefly. The author considers modern filters as almost ideal, the errors being due to deficiencies in inks and introduction of the halftone screen. Controlled masking can overcome these deficiencies. The Kodak Fluorescence process and the Kodagraph screen are briefly discussed. Research should be directed toward solving the problems and reducing the cost of controlled color reproduction.

***Colour News—Density Determinations of Colour Film.** "British Journal of Photography" 93, No. 4510, October 11, 1946, pp. 366-7 (2 pages). The Ansco Color densitometer makes use of the idea that a color density should be expressed as numerically equal to the grey density to which it could contribute if put with just the right amount of its complementary to form a grey. The densitometer, by making density measurements in each of three narrow spectral bands by means of filters, a complete sensitometric evaluation of each layer could be deduced. This theory and the design and use of the densitometer is described. The question of whether the change of contrast of the film as a whole affects the hue is discussed.

* IMPROVEMENT OF PHOTOGRAPHIC COLOR RENDERING BY CORRECTION FILTERS. A. Van Kreveld. *Journal of the Optical Society of America* 36, No. 7, July, 1946, pp. 412-415 (4 pages). Multiplying factors of some photographic correction filters are calculated by means of the addition law and are found in fair agreement with the practical figures given by the manufacturers. The improvement of color rendering by the correction filters is calculated in the same way; it is very considerable. It is shown, that each filter can be characterized by three "improvement-factors," indicating the improvement of the green, yellow, and red colors, respectively. The improvement-factors are—in contradistinction to the multiplying factors—nearly independent of the color-sensitivity of the emulsion. It is argued that green correction filters are not generally useful, whereas (hypothetical) pale orange filters should yield the best possible color rendering.

***Correction of Color-Separation Negatives.** Benjamin L. Sites, assignor to Miehle Printing Press and Manufacturing Company. "U. S. Patent No. 2,354,149" (July 18, 1944). In the pro-

cess of making a photographic-transparency protective-overlay through a first designated-color separation-negative of a multi-color subject for use with a second different designated-color separation-negative of the same subject, said first separation-negative including a group of separated-colors each incorporating said first separation-negative designated-color, said second separation-negative including a group of separated-colors each incorporating said second separation-negative designated-color, said subject having areas of different colors including (1) White and (2) the blended-color which would be produced by a combination of the designated colors of said two separation-negatives, the novel combination of steps, in any operative order, of: (a) determining in said first separation-negative said White-area density (b) determining in said first separation-negative said blended-color area density, (c) determining in said second separation-negative said White-area density, (d) determining in said second separation-negative said blended-color area density, (e) preliminary determining the density-gradient of the photographic-overlay to be produced through said first separation-negative for use with said second separation-negative, said density-gradient being the ratio of the density-range of said blended-color in said second separation-negative to the density range of said blended-color in said first separation-negative, said gradient including as the density of said blended-color area the sum of the density-range of said blended-color in said second separation-negative and the developed White-area density, if any, in the overlay to be produced, (f) exposing a light-sensitive photographic-medium of known properties through said first separation-negative and developing and fixing said exposed medium to produce a photographic-overlay having said preliminarily-determined density-gradient and having its said blended-color area density such that when combined with said blended color area density of said second separation-negative their combined blended-color area densities will at least equal the combined White-area densities in said second separation-negative and overlay. "Official Gazette" 564, No. 3, July 18, 1944, pp. 515-6.

• COLOUR PRINTING IN GERMANY (PHOTO-LITHOGRAPHY). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 54, No. 640, April, 1947, p. 106 (1 page). Two processes for making color photographs, developed in Germany, are described. In the Duxachrome process, the yellow, red and blue Duxachrome films are exposed under the appropriate negatives through the celluloid side, developed by a time and temperature technique, fixed in acid-hypo solution and then washed out in hot water. The silver image is afterwards dissolved, leaving the color images which can be modified if necessary by further washing out in hot water. The transfer of the color images to paper corresponds to the transfer to final support in the ordinary carbon process. The Agfacolor process is a method for producing color prints on paper from color transparencies of the "integral" type. A color transparency negative is used and the print is made by contact or projection with a processing time of 40-50 minutes. Some control over color values is possible by the use of filters. It is mentioned that Agfa materials are also being produced in the United States by Ansco.

• TRICOLOR CARBRO PROCESS SIMPLIFIED. Ernest M. Symmes. *American Photography* 41, No. 3, March, 1947, pp. 28-9 (2 pages). The standard procedure for making tricolor carbro prints is described. A. simplifi-

cation of this process is discussed in which all transfers of images from three celluloids to paper, and from one paper to another are eliminated.

• NEW PROCESS SIMPLIFIES COLOR PLATE MAKING. S. L. Gins. *National Lithographer* 53, No. 12, December 1946, pp. 28-9 (2 pages). The Craftint Multicolor Process is an inexpensive method of producing color plates for the low cost buyer of lithography. This process consists of a set of three processed drawing boards or acetate films bearing two benday type screens photographically invisible until developed. They are angled to prevent moire and are in perfect register. The boards provide complete camera copy for their respective color plates, the films either complete finished negatives for production of albumen color plates or final positives for the production of deep etch offset plates. By superimposing in various combinations a range of sixty-three colors is made possible.

• LETTERPRESS PROCESS COLOR PLATES ARE CONVERTED TO LITHOGRAPHIC REPRODUCTION. Glenn C. Compton. *Inland Printer* 117, No. 6, September, 1946. pp. 48-50 (3 pages). Practical applications of the process of producing full color lithography from letterpress process plates are cited. Economy and flexibility are among its advantages. Letterpress color is converted to lithography by obtaining good black proofs or transparent positives of the four process plates. These proofs or transparencies become the lithographic copy. The success of conversion depends upon the degree to which the dot structure and tonal values of the original plates are preserved. The various techniques used to obtain reproduction proofs or transparent positives and the difficulties involved are described. Best results to date seem to have been obtained with the transparent positives on cellophane.

See I, 3. Color separation negatives from 35 mm color transparencies.

18. Color transparencies

• MULTI-LAYER COLOR TRANSPARENCIES. J. S. Mertle. *Modern Lithographer and Offset Printer* 42, No. 11, November, 1946, pp. 204-5 (2 pages). The Kodachrome film comprises a celluloid base or other support on which is coated three different emulsions each sensitive to a definite region of the spectrum. The exposed Kodachrome film must be sent to the manufacturer for development and processing; however, the processing procedure is summarized briefly in this article. When making reproductions from transparencies of the Kodachrome type, the following factors are of great importance: lenses used for enlargement; illumination; light source and strength; the use of masks to aid color separations. These factors are all discussed.

• PHOTOMECHANICAL DEVELOPMENTS. Richard W. Gardner. *Printing Equipment Engineer* 73, No. 2, November, 1946, pp. 18, 19 (2 pages). Among the developments discussed is Ektachrome, Kodak's new color transparency material. Ektachrome has a lower contrast than obtained with Kodachrome and thereby the rendering of highlight and shadow detail is improved. It permits a range of lighting approximating that used in black-and-white work. It can be processed by the photographer him-

self. The area mask, the unsharp mask, and the highlight mask are described and instructions are given for masking Ektachrome. The Kodak Fluorescence Process, and the Kodak Dye Transfer Process are discussed.

•KODAK EKTACHROME FILM AND ITS REPRODUCTION. John T. Groet. *Photo-Engravers' Bulletin* 36, No. 4, November, 1946, pp. 138-141 (4 pages). The processing of Ektachrome, Kodak's new color film, can be done by the user. Suggestions are given for reproducing Ektachrome transparencies. The four methods for making separation negatives from a transparency are briefly reviewed. Indirect negatives from a photographically masked transparency is the preferred method. Two types of masks are used in making plates from Ektachrome. Masks which reduce the brightness range of the transparency to bring it within the practical limits of the printing process, and also effect a degree of color correction, are used; and an additional "highlight" mask may be used in cases of transparencies in which highlight detail and gradations play an important part. The masking method is described.

19. Masking methods

IMPROVED MASKING METHOD FOR COLOR TRANSPARENCIES. R. P. Speck. *Journal of the Photographic Society of America,* 11:461-66, November, 1945. Communication No. 1042. Two masks are involved in the technique described for masking Kodachrome transparencies. The "prinicpal mask" is a single gray negative mask of a type previously described for approximate relative color brightness correction. The other is an "auxiliary or highlight mask," which is printed from the transparency and then used, in combination with the transparency, for printing the principal marsk in order to improve the tone rendering in the highlight portions of the finished color print. The auxiliary mask is made on high-contrast Kodlith Orthochromatic Film, which is exposed with its support side in contact with the emulsion side of transparency. The exposure is made through the red backing of the Kodalith Ortho, and is sufficient to produce a negative image of the highlight portions only, which normally lie on the toe of the characteristic curve of the transparency. After development in Kodalith developer, the auxiliary mask is dried and registered with the transparency. The principal mask on Kodak Masking Panchromatic Film is exposed through the combination of the transparency and the auxiliary mask, through a Wratten No. 25 red filter and through the support side of the Masking Panchromatic Film. The principal mask is developed to a relatively low gamma by 3-minute development in DK-50, 8 parts and benzotriazole (0.2% solution), 1 part. The principal mask is registered with the transparency, and the separation negatives are made through the combination. Since the auxiliary mask reduces the density of the principal mask in the highlight portions, a more nearly straight-line reproduction curve is obtained in the finished color print. *Monthly Abstract Bulletin of Kodak Research Laboratories* 32, No. 12, December, 1946, p. 442.

•THE MASKING METHOD OF COLOR REPRODUCTION. *Bulletin for the Graphic Arts,* No. 8, 1946, Eastman Kodak Co., 8 pages. The five main reasons that color correction is necessary are discussed. The masking method will often cut down the total

time required for making a set of printing plates, thereby increasing the commercial use of color reproductions; it will make the retoucher's or color etcher's job easier; it will improve the quality of reproductions. The advantages of unsharp masks are touched upon, together with details of their making and use. Details are given for masking Kodachrome transparencies.

PHOTOGRAPHIC TONE CORRECTION MASK. Ralph M. Evans and Wesley T. Hanson, Jr., assignors to Eastman Kodak Company. *U. S. Patent No.* 2,405,739 (August 13, 1946). A photographic element comprising a photographic color transparency having low contrast in the regions of high and low exposure and high contrast in the regions of intermediate exposure, and in registered printing relation therewith as a tone and color-correction mask, a colloid relief image having a characteristic curve whose straight line portion has density variations of opposite sign to the density variations of the regions representing intermediate exposure in the transparency, and whose shoulder portion has density variations of the same sign as the density variations of the regions represented by the toe of the characteristic curve of the transparency. *Official Gazette* 589, No. 2, August 13, 1946, p. 269.

COMBINED TONE- AND COLOR-CORRECTION PHOTOGRAPHIC MASK. F. C. Williams, W. T. Hanson, Jr., and H. F. Ott, assignors to Eastman Kodak Company. *U. S. Patent No.* 2,384,665. A combined tone- and color-correction photographic mask, used in a process of printing a color transparency in natural colors, is produced by giving a light-sensitive emulsion layer an exposure with white light through the color transparency sufficient to record only the toe densities of the transparency, developing in the exposed layer a silver image of sign opposite to the color transparency and of relatively high contrast, exposing a second light-sensitive emulsion layer through a combination of the color transparency and the image in the first exposed and developed emulsion layer, and developing a silver image in the second exposed layer of sign opposite to the color transparency and of gamma 0.3 to 0.6 in the straight-line portion of its characteristic curve and of the same sign as the color transparency in the shoulder portion of the curve. Such a mask tends to straighten the toe or shoulder portion of the characteristic curve in the color print, according to whether the original color transparency is a positive or a negative. *Monthly Abstract Bulletin, Kodak Research Laboratories,* 32, No. 6, June, 1946, p. 215-6.

PRODUCTION OF CONTACT MASKS. G. Ehrenfried, assignor to Eastman Kodak Company. *French Patent No.* 862,773 (January 6, 1939). For the production of contact masks, films are used which are coated with print-out emulsions of suitable color sensitivity. These are exposed to a very intense light, through a color filter if necessary. The film is fixed to the transparency to be corrected before exposure of the mask and is not separated until after reproduction or color separation. All difficulty of registration is thus avoided. *Corresponds to U. S.* 2,203,652. *Monthly Abstract Bulletin, Kodak Research Laboratories,* 32, No. 7, July, 1946, p. 241.

PHOTOGRAPHIC OR OPTICAL REPRODUCTION WITH THE AID OF MASKS. Kodak Ltd, W. T. Hanson, Jr., and R. M. Evans. *British Patent No. 581,926.* A masking process for use, e.g., in connection with coloured or black and white separations when producing colour reproductions or colour printers for use in photomechanical work, consists in masking a photographic record with a corresponding vectograph image and making the reproduction from this masked original with polarized light. *Printing Abstracts* 2, No. 2, February, 1947, p. 73.

20. Stripping methods

• DYED IMAGES ON VINYLITE, ACETATE AND GLASS. Anne Wahl. *Modern Lithography* 15, No. 1, January, 1947, pp. 31-32 (2 pages). A method is described for reproducing reversal lines and halftone images on vinylite base plastics, as well as on cellulose acetate and collodion coated glass. Information is given on the selection of dyes to produce colors wanted and the formulation of the proper solvent mixture to dye the vinylite without excessive penetration or spreading of the image. The procedure to follow in making revisions or corrections is described.

•KEYS AND SET-OFFS. J. S. Mertle. *Modern Lithographer and Offset Printer* XLII, No. 4, April, 1946, pp. 64-5 (2 pages). The making of photographic prints on white metal plates is considered with special emphasis being given Ducoplates. The print can be either a blue print or a non-actinic image depending on its purpose. Directions are given for making changes, working up parts of blue images to be reproduced, and doing "fake color work" on blue prints. Processing procedure is given for making the blueprints.

See III. Plastic Sheets in Litho Production.

21. Photoelectric tone control

• MAKING FOUR SEPARATION IMAGES FOR A FOUR-COLOR REPRODUCTION PROCESS. Interchemical Corporation (Arthur H. Stevens). *British Patent No. 566,346* (December 27, 1944). An apparatus is described which comprises 3 separate photoelectric receptors upon which 3 different spectral components of a colored subject are directed, means for selecting at each instant the greatest of the 3 electrical responses of the receptors and utilizing the selected response to provide an achromatic separation image, and also means for producing and utilizing the difference between each selected response and the concurrent individual response of each photoelectric receptor to provide 3 chromatic separation images. *Chemical Abstracts* 41, No. 3, February 10, 1947, p. 654.

Electro-Optical Apparatus for the Reversal of Color Negatives. F. Biedermann, "U. S. Patent No. 2,374,916" (February 17, 1942). An electro-optical apparatus for the reversal of color negatives, permitting them to be viewed as color positives, comprises an image-converting tube provided with a photocathode, a control electrode hava light-sensitive layer and controlling the electrons emitted by the cathode, and a fluorescent screen, an objective between the cathode and the color negative, and two filter sets in identical primary colors, one set being in the light path between the negative

and the cathode, and the other set in the path between the fluorescent screen and the observer, in such a manner that identical filter colors are always in the two beams simultaneously in scanning the negative. "Kodak Monthly Abstract Bulletin" 31, No. 12, December, 1945, p. 390.

PROCESS FOR PRODUCTION OF GRAY PRINTERS FOR PHOTOMECHANICAL MULTICOLOR PRINTING. V. C. Hall and R. S. Morse, assignors to Eastman Kodak Company. *German Patent* No. 732,535 (March 25, 1939). A process for the production of gray printers for photomechanical multicolor printing by electro-optical scanning of a multicolor original is distinguished by the fact that, for the electro-optical reproduction, and electronic amplifying circuit of known type with a common output is employed in which, for every channel, a special amplifier is provided, to which the corresponding alternating current as well as the rectified potentials of the channels are conducted in such a way that amplification takes place only if the current strength or potential in the channel in question is greater or less than in the neighboring channels. *Kodak Monthly Abstract Bulletin* 31, No. 12, December, 1945, P. 390.

METHOD AND APPARATUS FOR MAKING GOOD SEPARATION NEGATIVES. Louis A. Thompson, assignor to NEA Service, Inc. *U. S. Patent No. 2,415,051* (January 28, 1947). An apparatus for making color separation negatives, including a scanning unit and a plurality of exposure units, said scanning unit comprising an objective lens system for picking up an image of a spot being scanned, means for taking the composite beam and converting it into a pair of beams each having the same components as the original beam; means for swinging said beams; a plurality of photocells disposed in the path of said beams and energized thereby, said photo cells being connected to said exposure units to control said exposure units. *Official Gazette* 594, No. 4, January 28, 1947, pp. 520-21.

22. Photographic typesetting

*Photo - Typesetting. "Printing Equipment Engineer" 72, No. 2, May, 1946, pp. 18, 19 (2 pages). Two phototypesetting mechanisms are being developed in the United States by Intertype Corporation and Huebner Laboratories. The structural features of these machines are described and compared as to similarities and differences with the standard hot-metal machines.

*PHOTOGRAPHIC TYPESETTING. Eugene A. Nuelle. *Lithographers' Journal* 31, No. 7, October, 1946, p. 430 (1 page). There are two distinct methods in photo-typesetting; one actually sets type mechanically by photography; the other reproportions type already set to fit a given area. Phototextype and another typesetting invention, both of which produce photographic film in galley form, are discussed. Both of these processes will save considerable time in typesetting but neither is in actual production at this time. Type is reproportioned by means of special lenses that reduce or elongate the proof of a line to length or width wanted. These lenses also italicize or backslant prints of straight type. Photo lettering, in which fonts of specially printed characters fit into holder and can be spaced to any length for photographing to correct size with use of normal proportion, can be done with any camera equipment and needs no special lenses.

Reproportioning has actually been in use for several years.

• PHOTO-COMPOSING MACHINES. Frank H. Smith. *Process Engravers' Monthly* 54, No. 638, February, 1947, pp. 48, 49 (2 pages). Various photo-composing machines are described and their uses and advantages discussed including the Linotype, Intertype, and Orotype machines.

23. Typewriter photographic copy

*The Typewriter—As A Typesetting Substitute. *National Lithographer* 54, No. 3, March, 1947, p. 42 (1 page). Many lithographers have found the typewriter of value in producing copy for booklets, catalogs, and other material. Described here are some of the newer machines now on the market, including "The Visible Line" typewriter, two electromatic machines produced by the International Business Machines Corporation, the Royal Photo Offset Typewriter, the Underwood Automatic Right Hand Adjustifying Typewriter. Also discussed are the Edison Margin Justifier, an accessory which may be installed on all standard typewriters, converting any current model to a Justifying Composing Machine, and the Coxhead Vari-Typer, which although not a typewriter in the strictest sense of the term, is operated in the same manner.

II. PLANOGRAPHIC PRINTING PROCESSES

1. General

• DUPLICATION (PHOTO-LITHOGRAPHY). A. Haigh and H. M. Cartwright. *Process Engravers Monthly* 53, No. 636, December, 1946, p. 330 (1 page). The following methods of duplication are discussed briefly: duplicate originals are patched in position and photographed to make one large negative; transfers are taken from the original photo-litho plate and patched up for transferring in the usual way; direct transfers are made on an offset transfer machine; duplicate positives or negatives are fixed in position to make a large composite positive or negative; a step-and-repeat negative or positive is made; a single negative or positive is stepped-up on the plate in successive exposures.

2. Dichromated colloids

*DICHROMATE-COLLOID LAYERS. P. C. Smethurst. Part I—*Process Engravers' Monthly* 53, No. 629, May, 1946, pp. 114-115. Part II—*Process Engravers' Monthly* 53, No. 630, June, 1946, pp. 142-143 (Total of 4 pages). The mechanism of "staling" (the spontaneous hardening which takes place in a coated layer of gum dichromate on storage in the dark) is described. It is pointed out that, while there is a general similarity between conditions in the solution and those operative in the coated and dried layers, the two sets of conditions cannot be considered in any way as identical and their differences are discussed. Tests on the variation of staling with variation in the solution pH, as well as other tests and their results, are described and suggestions are given for the reduction of staling.

*DICHROMATE-COLLOID LAYERS – III (THEORIES OF LIGHT SENSITIVITY). P. C. Smethurst.

Process Engraver's Monthly 53, No. 632, August, 1946, pp. 198-9 (2 pages). Three theories which purport to account for the hardening action of light on a dichromated-colloid layer are as follows: the first ascribes the hardening effect to oxidation; the second postulates a tanning effect; Eggert's involves the quantum theory and is based on ionic reactions and adsorption effects. The five requisites of a theory explaining light sensitivity in dichromate-colloid systems are listed and it is pointed out that all three of these theories fail to meet these requisites satisfactorily. The oxidation theory, which is the most inadequate, is explained in this article.

•DICHROMATE-COLLOID LAYERS—V. P. C. Smethurst. *Process Engraver's Monthly* 53, No. 634, October, 1946, pp. 254-5 (2 pages). The chromyl ion theory, put forth by Eggert, is explained. A new and tentative hypothesis for light-sensitivity which is based primarily on energetics is suggested.

3. Planographic printing surfaces—general

SURFACE USEFUL MATERIALS. Cole Coolidge, assignor to E. I. du Pont de Nemours and Company. *U. S. Patent* No. 2,399,208 (April 30, 1946). An improved process of making a planographic printing plate which comprises providing a suitable base, coating said base with a substantially completely hydrolyzed vinyl acetate-ethylene polymer having, after hydrolysis, from 3-30% ethylene in the copolymer and selectively locating grease-receptive printing layers on the interpolymer surface. *Official Gazette* 585, No. 5, April 30, 1946, p. 697.

USE OF COLLOIDAL LAYER AS PRINTING SURFACE. I. G. Farbenindustrie. *French Patent* No. 878,037 (December 26, 1941). As a printing surface for a duplicating process, a strongly hardened colloid layer with the addition of solid or liquid hygroscopic substances is employed which is not thicker than 0.1 mm., even when swollen. This is written upon with a typewriter or by hand with a dye containing a bichromate. The hardening action of this upon the layer is intensified by treating the layer with solutions of hydroxylaminehydrochloride, hydrazinehydrochloride, or similar compounds in organic solvents. Exposure to light is then no longer necessary. After sufficient moistening, the surface treated in this manner is suitable for planographic printing with a hand or mechanical press. Textiles, paper, metal foil, cellulose ester films, and artificial resin films are employed as a base for the colloidal layer. *Kodak Monthly Abstract Bulletin* 31, No. 12, December, 1945, p. 411.

Printing Plate Means. William Craig Toland. "U. S. Patent 2,413,664" (December 31, 1946). A planographic printing plate comprising in combination; a thin, flexible, support member presenting marginal surface portions adapted to constitute non-printing portions, said surfaces surrounding an opening in spaced relation to the outer edges of the support member, an insert planographic printing plate secured within the said opening and substantially filling the same with its edges lying in abutting relation to the walls of the opening, said support member providing substantial clamping edges for securing the said planographic printing plate to a printing cylinder. "Official Gazette" 593, No. 5, December 31, 1946, p. 719.

Printing Plate. A. W. Buck and J. W. Miller, assignors to Buck X-Ograph Company. "U. S. Patent No. 2,387,-056." A lithographic printing plate is sensitized with a mixture of casein, gelatin, borax, and a sensitizer. "Monthly Abstract Bulletin" 32, No. 3, March, 1946, p. 103. (Eastman Kodak Co.)

• PRINTING. Walter Fuchs. *British Patent No. 566,705.* (January 10, 1945). A gelatin printing surface contains oxidizable salts, such as the sulfates of Fe (ferrous), Ni, Zn, Mn, Co, and Cu, and ferrous ammonium sulfate. The original image is produced on any suitable surface with a graphite pencil containing an oxidizing salt, such as the dichromates of Na, K, and NH_4 and $K_3Fe(CN)_6$. When this drawing is applied to the gelatin surface, an oxidized, dull, hardened gelatin image is produced which is receptive of greasy printing ink. *Chemical Abstracts* 41, No. 4, February 20, 1947, p. 922.

BICHROMATED COLLOID LAYERS: PHOTO-MECHANICAL PRINTING SURFACES. Morland & Impey Ltd. and A. G. Rendall. *British Patent No. 560,245* (October 20, 1942). A thin sheet metal plate (e.g., of aluminum) for planographic printing carries a light-sensitive bichromated colloid layer and above this a removable impervious film of any suitable substance, e.g., of chlorinated rubber applied in the form of a varnish consisting of chlorinated rubber and a volatile solvent (e.g., benzene or carbon tetrachloride). The bichromated colloid layer is made very dry before application of the protective film. A non-actinic dye (e.g., fat scarlet AB) may be added to the varnish. The protective film, which is stripped before use, obviates the need for storage in a container which contains a desiccating agent or which is evacuated. *Abridgment of Specifications* 560,001-580,000. Group XX, pp. 6-7 (Great Britain Patent Office).

Process For Making Positive or Negative Printing Matrices By Addition. H. Eggen. "German Patent" No. 717,042. A process for making positive or negative printing matrices by addition is characterized by the use of a printing plate having a light-sensitive layer and a transparent light-sensitive film, the combination being exposed to light additively under a matrix whereupon the film is converted to a printing matrix and the combination is again exposed to light for a short time and the film separated. The underlying plate is then ready for use as a printing form. "Monthly Abstract Bulletin" of the Kodak Research Laboratories 32, N. 11, November, 1946, p. 391.

• LITHOGRAPHIC PRINTING PLATES. E. E. Loening and C. H. Mitson, assignors to Kodak Ltd. *British Patent No. 565,752* (March 22, 1943). Cellulose acetate sheet is surfaced hydrolysed, for instance, with 50% sodium hydroxide solution, coated with an unhardened silver emulsion, exposed and processed with a tanning developer to form a stencil and, the hydrolysed layer removed with zinc chloride solution (60 Be). The stencil is then removed with sodium hypochlorite solution, leaving a hydrolysed design on cellulose acetate. The latter accepts lithographic ink and the former, on damping, refuses it. Numerous alternatives are given, such as a hydrolysed acetate layer on cellulose nitrate or metal or the formation of a stencil on cellulose acetate followed by hydrolysis through the stencil, using 2% sodium hydroxide in aqueous alcohol and ace-

tone. The process may be used to produce a coloured design by applying dyes which colour the hydrolysed or non-hydrolysed parts. *Photographic Abstracts* 25, No. 98, Part 2, 1945, p. 49.

Printing Process. Edward Jahoda, assignor to Walter M. Fuchs. "U. S. Patent No. 2,412,889" December 17, 1946). In the art of printing with moisture repelled, greasy printers' ink with a non-hygroscopic, initially untanned gelatin surfaced, thin, water absorbent, wet strength paper printing plate having a superficial printing image of hardened gelatin on and surrounded by an unhardened ferrogelatin background, the image having been produced on the background by surface contact thereof with an original image containing a primary chemical which reacts superficially with the ferrogelatin background to harden the engaged portions thereof to form the selective and superficially hardened image, so that there is unhardened gelatin underlying the image area as well as surrounding it, the step of feeding moisture to the plate from the back thereof, so that the moisture passes through the plate to the printing surface thereof, thus maintaining the water balance therefor, and also maintaining a constant minimum differential of level of the image and non-image areas, by applying the paper to and in contact with a moist porous stone block which wets and cools the paper. "Official Gazette" 593, No. 3, December 17, 1946, p. 409.

• TRACING PLATE TROUBLES TO THEIR SOURCE. Charles F. King. *Inland Printer* 118, No. 3, December, 1946, pp. 51-54. (4 pages). The three most frequent causes of blind plate trouble are: poor gumming, incomplete development, and improper preparation of the surface prior to the applying of the base. Some cases of scumming can also be traced to the platemaking department. Information is given on how these troubles can be recognized, and how many of the plates may be saved.

4. Albumin plates

•NEW ALBUMIN DATA. Michael H. Bruno and Anne Wahl. Part I —*National Lithographer* 53, No. 7, July, 1946, pp. 32-3, 71-2 (4 pages). Part II—*National Lithographer* 53, No. 8, August, 1946, pp. 30-1, 84-5 (4 pages), (total of 8 pages). In research conducted to determine what makes some albumins satisfactory for lithographic use and others unsatisfactory, some interesting data were obtained on the following properties of five egg and two blood or serum albumins: color and pH; specific gravity; effect of ammonia on solution rate, amount of albumin dissolved, and specific gravity. These data and the conclusions reached from them are discussed and charts are given.

• WHY CAN'T YOU RUN ALBUMIN PLATES? Charles F. King. *Inland Printer* 119, No. 2, May, 1947, pp. 59-61 (3 pages). This is the first of a series of articles which will review the operations and materials required in the photo-lithographic process in order that the importance of each operation will be understood in the light of the one which succeeds it. It is pointed out that it is not enough for each craftsman to know his own particular operation, but he must also keep in mind how each operation will affect the final press sheet. The Lithographic Technical Foundation's Research Bulletin No. 6 "The Albumin Process in Photo-Lithography" is recommended for a descrip-

tion of all the materials, methods, and techniques required in the process. The terms "etching", "counter-etching", and "pre-etching" are explained and the use of these solutions described.

*HUMIDITY AND ALBUMIN PLATES. Henry A. Beechem. *Graphic Arts Monthly* 18, No. 7, July, 1946, pp. 42-43 (2 pages). The changes that must be made in plate-making during the summer to avoid the usual plate failures due to high humidity are discussed. The specific gravity of the albumin coating must be sufficiently high to produce a reasonably thick coating on the plate. The speed of the whirler should be cut down somewhat during the summer and it cannot be the same for both small and large plates. The coating solution should be stored in a refrigerator and not held too long. Shortening the time of light exposure during the summer and the reasons for this adjustment are discussed. It is especially desirable in summer also to pre-etch the plate after counter-etching and before coating. The most important point to remember is that once the best procedure is arrived at, it should not be varied so long as humidity and temperature remain high.

*ADJUST OFFSET PLATEMAKING TECHNIQUE TO THE WEATHER. Henry A. Beechem. *Inland Printer* 117, No. 4, July, 1946, pp. 67-68 (2 pages). The causes of plate troubles due to changes in humidity are analyzed and steps are suggested to prevent them. The ideal albumin plate is one whose film of coating evenly covers both the valleys and the crests of the grain. In humid weather it may be necessary to increase the specific gravity of the coating and/or decrease the speed of the whirler to obtain such a plate; however, caution is given against applying the coating too thick or decreasing the speed of the whirler too much or the valleys of the grain will be completely filled in. Exposure time should be shorter in the humid weather. Factors to be considered in hot weather are that many chemicals are active only in the presence of moisture, the speed of chemical activity is roughly doubled for every 18° Fahrenheit rise, and the effect of heat on coating solutions during storage from time of preparation until its use.

5. Deep etch plates

Platemaking For Offset Lithography —Deep-Etch. "Lithographic Technical Foundation," 131 East 39th Street, New York 16, New York. Shop Manual No. 23, 25c. This manual contains formulas and complete instructions for making deep-etch plates. In addition the various hazards are discussed with emphasis on prevention of troubles. The booklet contains much technical and practical information for the lithographic plate maker.

* RESEARCH ON DEEP-ETCH OFFSET PLATES. A. G. Arend. *Paper and Print* 20, No. 1, Spring, 1947, pp. 15, 16 (2 pages). An improved method of making deep-etch offset plates without the use of alcohol is described in detail, and compared with the normal method. Plates suitable for this process should possess a uniform, soft, velvety appearance, which type of grain structure provides the maximum degree of effective ink and image receptive characteristics, besides an adequate retention of moisture.

*Offset—Developers and Deep-Etching Materials. Charles F. King. "In-

land Printer" 117, No. 3, June, 1946, pp. 53, 54, 55 (3 pages). Deep-etch developers are discussed as to their composition, swelling and dissolving effects upon gum, concentration adjustment requirements, and maintaining of tonal values. The importance of complete development is stressed. The use of the deep-etch solution and its purpose are set forth. The controversy regarding whether to follow the deep-etching solution by another application of developer is briefly summarized. Tests with developers are described and results are given.

*Solutions for Deep-Etch Platemaking. Charles F. King. "Inland Printer" 117, No. 6, September, 1946, pp. 55-58 (4 pages). Removal of the exposed deep-etch coating when the relative humidity is high is discussed. A table is given to use in making a heavier coating solution while maintaining the same relationship between the amount of ammonium dichromate and dry gum. A method is described to secure solutions of 14 Baume. The "gumming" or "gumming in" operation is described. The properties of gum arabic, its use in etching or desensitizing mixtures, and experiments with cellulose and other materials as substitutes are discussed.

*FINAL STEPS IMPORTANT IN PLATEMAKING. Charles F. King. *Inland Printer* 117, No. 5, August, 1946, pp. 49-51 (3 pages). Much press time is wasted by improper finishing of plates. The two possible methods of removing the deep-etching solution are considered. Properties that a lacquer must have to be usable in the deep-etch process and the reasons for these requirements are explained. The use of other lithographic bases is mentioned. Also discussed are: the treatment for blind plates, life of deep-etch plates, and properties of a good developing ink.

*DEEP ETCH PLATES DIRECT FROM NEGATIVES. Herbert P. Paschel. *Modern Lithography* 14, No. 9, September, 1946, pp. 61, 63, 65 (3 pages). A platemaking process working directly from negatives which would result in an image with the character and durability of a deep-etch plate is described. In this method the making of the positive image necessary for exposing deep-etch coatings, usually accomplished by photography, is accomplished by a platemaking process. A brief, step by step outline of the operations involved is given. A typical formula is given for a sensitizer; however, the most satisfactory results were obtained in the tests made with a commercially available resinous sensitizer. Advantages of this method are enumerated.

* REVERSED DEEP-ETCH PHOTO-LITHO WITH FERRIC SALTS AND GUM ARABIC (I). P. C. Smethurst. *Process Engravers Monthly* 53, No. 636, December, 1946, pp. 310-11 (2 pages). Ferric salts have been used instead of a dichromate to sensitize gum in an attempt to develop a deep-etch process in which printing positives would be unnecessary since a negative image on metal would result from printing through a negative on to the layer. Processes being used today are based on the indirect method of coating plain gelatin layers on metal, and then soaking these layers in a solution of a ferric salt in order to sensitize them. Details are given of conditions under which gelatin is hardened by ferric salts. However, difficulties encountered include unexplained variations in sensitivity of coatings coupled with the need for some storage before their full light sensitivity develops.

***REVERSED DEEP-ETCH PHOTO-LITHO WITH FERRIC SALTS AND GUM ARABIC (2).** P. C. Smethurst. *Process Engravers' Monthly* 54, No. 637, January, 1947, pp. 5, 7 (2 pages). When a ferric salt solution is poured into gum or gelatin solution, there is a local pH rise at the surface of contact between the two solutions and ferric hydroxide is readily precipitated, hardening the colloid in strings or clots except in the case of low concentrations of colloid, in which event coating solutions are not light-sensitive immediately on coating but require maturing before use. To obtain a solution which is light-sensitive immediately on coating it is suggested that the gum solution be added in a thin stream to the solution of the ferric salt while the latter is being stirred vigorously. The permanent excess of ferric salts in the solution will then harden and at once redisperse the gum or gelatin. When coating on metal it is essential to use some kind of substratum to keep the metal base and sensitized layer away from one another to prevent the metal from being attacked by the acid.

***Reversed Deep-Etch Photo-Litho with Ferric Salts and Gum Arabic, Part 3.** P. C. Smethurst. Process Engravers' Monthly 54, No. 638, February, 1947, pp. 31, 33 (2 pages). Such inorganic ferric compounds as ferric chloride and ferric nitrate are so strongly acid in solution that the pH value of these solutions normally lies considerably below the optimum range of pH values for the process. It is normally necessary to add sufficient free acid to bring the solution to the required pH value. The selection of a suitable acid and the formulation of the coating are discussed. Instructions are given for determining, by experiment, the smallest proportion of sensitizer which can be added to a given volume of gum to produce a coated layer which stands up to development without showing any tendency to lift.

6. Bimetallic plates

*** OFFSET PRINTING PLATE.** T. Petren and E. K. W. Sternberg, assignors to Ahlen & Akerlunds Forlag. *British Patent No. 564,753* (April 2, 1943). Plates of stainless steel or other non-oxidizable metal having good ink-repelling properties are roughened, cleaned in a solution of 2% formic acid, 5% alum and 2% nitric acid, coated with bichromated colloid, for example a mixture of albumin and gum arabic, exposed and developed in 36° Be calcium chloride containing lactic acid and alcohol, the lactic acid preventing passivity of the metal. After development the bare areas are treated with an etching solution of about 39° Be calcium chloride containing about 2.5% ferric chloride, 1% nitric acid, 3% hydrochloric acid and 2.5% cuprous chloride from which a copper layer of nearly mono-atomic thickness and mostly quite invisible is deposited. The ferric chloride is adjusted to lower the potential between the plate and the bath and so prevent rapid deposition of copper. The specific gravity of the solution (1.2-1.4) prevents precipitation of ferric hydroxide. Following this treatment grease is applied which adheres to the copper layer, and the hardened colloid image is removed by water only, these portions then being water receptive. In producing such bimetallic plates no special apparatus is required. *Photographic Abstracts* 25, No. 99, Part 3, 1945, p. 73.

***Observers Say Bimetallic Plate May Revolutionize Lithography.** Can-

adian Printer and Publisher 56, No. 3, March, 1947, p. 52 (1 page). Favorable tests made with Aller bimetallic plates at the factory of R. W. Crabtree & Sons, England, are described. This company plans to install tanks for the copper coating and for the electrolytic developing. The cost of these bimetallic plates is compared to deep-etch. The copper deposit on these plates can be cleaned off and the plate used repeatedly. Other advantages are discussed briefly.

7. Plastic plates

Method of Making Printing Members. Robert G. Chollar, assignor to The National Cash Register Company. "U. S. Patent No. 2,413,747" (January 7, 1947). The method of making an elastic printing plate for use in cylinder printing, consisting of the step of impregnating a plate of transparent plasticized elastic polyvinyl alcohol in a saturated solution of sodium dichromate in water the step of stretching the plate an extent equal to the elongation of the printing surface which will occur when the plate is placed around the cylinder; the step of subjecting said stretched plate to a light pattern of the matter to be printed; and the step of etching the surface upon which light was projected by a water wash. "Official Gazette" 594, No. 1, January 7, 1947, p. 57.

Application of Light-Sensitive Substances to Plates, Films, or Photomechanical Printing Sheets of Superpolyamides. I. G. Farbenindustrie. "Danish Patent No. 60,806" (February 24, 1940). Light-sensitive organic or inorganic substances are applied to plates, films, or photomechanical printing sheets of superpolyamides. Preferably, stretched supports are employed. The stretching can also be done after the application of the light-sensitive layer. Such sheets are suitable as optical polarizers, for which purpose they may be dyed with dichroic substantive cotton dyes. "Kodak Monthly Abstract Bulletin" 31, No. 12, December, 1945, p. 404.

8. Dry lithography

•DRY LITHOGRAPHY. Charles F. Geese. *National Lithographer* 53, No. 10, October, 1946, p. 42 (1 page). Dry lithography is used successfully now for producing bank check tints, type labels and certain government tax stamps. However, most of our present day presses are not built accurately enough to maintain the close tolerances required for printing by dry offset. The blankets cannot vary more than .001 of an inch. The same rule applies to the printing cylinders and inking rollers. The plate must be very accurate in thickness and of a copper that will not stretch under pressure. If a successful method of dry lithography can be worked out it will make long runs possible and, because of the rubber blanket principle, will produce halftone dots far superior to the present conventional wet lithographic method.

• THE ALLER PROCESS (PHOTO-LITHOGRAPHY). A. Haigh and H. M. Cartwright. *Process Engravers' Monthly* 54, No. 637, January, 1947, p. 22 (1 page). In the Aller Process a very thin coating of copper is applied by electro-deposition to a polished stainless steel plate. The copper is subsequently etched away from the non-printing areas. Advantages include: this surface does not have to be grained and a perfectly formed line or dot image can be retained without difficulty; there are no problems such as oxidation, corrosion, or background tinting;

the plate seems to be lithographically indestructible; and it is possible to prepare the printing surface on a cylinder or on a segment of a cylinder, as well as on a flat plate.

9. Plate making equipment

Plate Whirler. James T. Campbell. "U. S. Patent No. 2,386,591." (October 9, 1945). A plate whirler comprising a hollow closeable housing, a freely rotatable plate holder journaled therein having an annular flange on the bottom thereof, rotatable means extending into said housing and loosely into said holder providing a journal therefor, and clutch means on said rotatable means having a corresponding annular flange frictionally engageable with said first annular flange. "Official Gazette" 579, No. 2, October 9, 1945, p. 282.

10. Plate desensitization

• THE CRONAK AND SIMILAR PROCESSES–CHECICAL ASPECTS. P. C. Smethurst. *Process Engravers' Monthly 54*, No. 639, March, 1947, pp. 58, 61 (2 pages). A brief description is given of the Cronack process. The chemical action of this process depends fundamentally on the exhaustion of the acid at the surface of the zinc as the latter is attacked. It is pointed out that it is also possible to form on the zinc an absorbed layer of chromic hydroxide without any CrO_3 content by using a chrome alum solution instead of the dichromate, and acidifying it with sulfuric acid. This process works on the same principle as the Cronak. Other anti-scumming processes are mentioned, and the conclusion reached is that, while the Cronak process is effective in preventing scumming, it is not the only process available for this purpose.

• THE NEW DILUTE PROCESS. Michael H. Bruno. *Modern Lithography* 15, No. 4, April, 1947, pp. 51, 79, 81 (3 pages). Cronaked zinc plates have longer life and print better with less trouble on the press because the Cronak treatment converts the surface of zinc to an inert substance which does not corrode and has practically no *chemical* reactivity. Other advantages include: Cronaked albumin plates develop easier than uncoated plates in the hottest weather and yet the image is firmer; desensitizing agents adhere better to Cronak treated plates; scum and image thickening are rare; and there is no image sharpening. The original Cronak process is described. The three main difficulties involved in its use were: it was patented; the high consumption of bichromate; and the dark color of Cronaked plates. These difficulties have been solved by the New Jersey Zinc Sales Company's issuing licenses for the use of Cronak upon application and payment of fee, and by the development, by the Lithographic Technical Foundation, of a modified Cronak process which incorporates all of the desirable advantages of the original process, but produces a much lighter color and uses only one-tenth the amount of bichromate.

*LTF Announces Replacement For Gum Arabic. "Modern Lithography" 14, No. 5, May, 1946, pp. 45, 123 (2 pages). The use of cellulose gum as a replacement for gum arabic is discussed. The advantages resulting from greater desensitizing effect are listed. The other advantages cellulose gum has over gum arabic or any other known desensitizing agent are also named. Other Lithographic Technical Foundation research projects that are mentioned briefly include: compilation of specifications for zinc and aluminum plate materials, graining evalu-

ation and standardization, tests on Cronak treated plates, study of effect of relative humidity on the light sensitivity of bichromated colloids.

11. Fountain solutions

*What's in An Etch? William H. Wood. "Harris Impressions" 6, No. 6, November-December, 1946, pp. 2, 4 (2 pages). The functions of an etch or fountain solution are to protect the non-printing portions of the plate from taking ink during the press run and to prevent oxidation and scumming of such non-work areas when the plates are not being printed. Some of the different ingredients that are sometimes used in etches are listed and it is pointed out that many of these materials have no value. Unless an ingredient helps to promote the adsorption of gum or the tanning of the gum molecules so that they become somewhat insoluble in water, it has failed in its purpose and probably would best be left out of the etch formula.

Dampener For Lithographic Printing. Thomas P. Brannigan, Gordon H. Raison, and Wm. H. Yoder, assignors to General Motors Corporation. "U. S. Patent No. 2,395,654" (February 26, 1946). A dampener for Lithographic printing or graining which comprises a solution of water, ammonium dichromate, gum arabic and a wetting agent having penetrability relatively greater than water. "Official Gazette" 583, No. 4, February 26, 1946, p. 645.

Repellent Solutions for Planographic Printing Plates. Charles H. Van Dusen, Jr., assignor to Addressograph-Multigraph Corporation. "U. S. Patent No. 2,393,875" (January 29, 1946). A composition for etching and dampening planographic printing plates comprises an aqueous solution of $(NH_4)H_2PO_4$, $Ni(NO_3)_2.6H_2O$, NH_4NO_3, diethylene glycol and CH_2O. In place of diethylene glycol equivalent quantities of ethylene glycol or propylene glycol may be employed. The glycols may be replaced with certain water-soluble invert sugars. In place of CH_2O, other water-soluble aldehydes may be used, such as AcH, BzH. "Chemical Abstracts" 40, No. 7, April 10, 1946, pp. 1955-6.

12. pH control

PH—WHERE AND HOW TO USE IT IN LITHOGRAPHY. F. R. McCrumb. *Modern Lithography* 14, No. 12, December, 1946, pp. 28-9 (2 pages). The pH scale may be regarded as a scale of active acidity and alkalinity. The principal application of pH in lithography is in control of the fountain solution. In addition, pH control of the albumin coating mix is useful. The effects of pH and the factors affecting it are discussed. The method of measuring pH by colorimetric comparison is described.

*CONTROL OF PH IN OFFSET PRINTING. F. R. McCrumb. *American Pressman* 56, No. 9, August, 1946, pp. 32-34 (3 pages). This article explains the meaning of pH in practical terms. The electrometric and colorimetric methods of measuring pH are mentioned with the colorimetric method being described in some detail as it has been proven the most satisfactory for pH control tests in offset. The outstanding application of pH in offset printing is in control of the fountain water. Troubles prevented by this control, the problem of preparing fountain solutions and maintaining them at desired pH value,

and the factors that may change pH value in fountain solution are discussed. PH control of albumin coating mix is also important.

LINE OPERATED PH METER. *Chemical Industries* 59, No. 1, July, 1946, p. 106. (1 page). Pfaltz and Bauer, Inc. are currently offering an inexpensive new type continuous-indicating direct-reading pH meter which is completely line-operated, which can thus be left on continuously as the current consumption is extremely low. This instrument eliminates time-taking and other bothersome adjustments, also frequent buffer standardizations. The instrument is small and has a large easily read scale graduated to 1/10th pH.

13. Plate grain

•PLATE METAL AND GRAIN STANDARDIZATION. S. A. Sheridan. *Modern Lithography* 14, No. 7, July, 1946, pp. 30-35 (6 pages). The work done at Armour Research Foundation and Lithographic Technical Foundation in connection with specifications for zinc sheet and aluminum sheet intended for mechanically grained litho plates is discussed. Drafts of these specifications are given. The various tests made in connection with standardization of grain itself and their results are also discussed and thirty-eight photomicrographs show various grained plate samples.

EVALUATION OF THE ROUGHNESS OF LITHOGRAPHIC PRINTING PLATES. G. A. H. Elton and G. Macdougall. *J. Soc. Chem. Ind.* 65 (1946), pp. 212-15. The chemical and physical methods developed to evaluate the "grain" of lithographic printing plates are reviewed and current procedures for measuring the roughness ratio, the surface-void volume, and the grain depth are discussed. *Chemical Abstracts* 41, No. 2, January 20, 1947, p. 543.

•THE GRAIN OF LITHOGRAPHIC PRINTING PLATES. *Annual Report, 1944-45 of The Printing and Allied Trades Research Association,* August, 1945, pp. 14-15 (2 pages). Work is being done by the Printing and Allied Trades Research Association in England to enable lithographic grains to be described in a precise manner. The three properties chosen for this investigation are: the surface area, the pore volume, and the depth. The methods developed for measuring areas and pore volumes are briefly described. Methods for measuring grain depth are in course of development.

14. Proving

PROVING FOR OFFSET LITHOGRAPHY. *Shop Manual No. 22.* Lithographic Technical Foundation, 131 East 39th Street, New York 16, New York. Price—25 cents. The various methods of lithographic proving are described, with advantages and disadvantages. Proving equipment, its care and adjustment, together with methods of operation, are discussed.

15. Offset presses

•A NEW OFFSET PERFECTING PRESS. *British and Colonial Printer* 139, No. 936, September 26, 1946, p. 196 (1 page). An Offset Perfecting Press recently placed on the market by R. W. Crabtree and Sons, Ltd., England, enables both sides of the sheet to be printed simultaneously instead of in succession as heretofore. This press can be used for ordinary

single-color work, or if it is necessary to print a job in more than one color on each side, this can also be easily accomplished. The design of the press is described and illustrated.

• PLANNING TWO-COLOUR WORK. *Modern Lithographer and Offset Printer* 42, No. 11, November, 1946, pp. 202-3 (2 pages). The advantages and disadvantages of two-color machines are discussed. Advantages include the saving in time on the run and the reduction of difficulties of registration. Probably the greatest disadvantage of the two-color machine is the difficulty of superimposing one color on another. Another difficulty that arises when printing two colors together is the tendency for the image on A cylinder to reproduce itself on B cylinder, giving rise to blinding, greasing, and thickening of B plate. Other problems that are discussed include: securing a sharp impression, order of printing on four-color jobs, and troubles with the brush.

• LITHOGRAPHY AS FOUND IN GERMANY, PART IV. Paul W. Dorst. *Modern Lithography* 15, No. 2, February, 1947, pp. 45, 47 (2 pages). Two captured German trailers containing direct rotary litho presses for map reproduction are described. The various types of presses manufactured by the Faber and Schleicher plant in Germany, including a special four-color offset press for printing on textiles, are discussed.

See II, 19. Newspaper printing by offset.

A PROTECTIVE CHEMICAL TREATMENT FOR TIN PLATE. R. Kerr. *J. Soc. Chem. Ind.* 65, 101-4 (1946). Immersion of tin plate for 10-60 seconds at 70-80° in a solution containing 8 g. $Na_2Cr_2O_7$, 20 g. Na_3PO_4, 20 g. NaOH, and 3 g. of a penetrating agent. Dispersol L or Teepol per l. and rinsing in water causes formation of an invisible film preventing blackening by S-contg. foods and retarding rusting in moist air. Exposure, humidity chamber, and cannery tests are discussed. No difference was found between treatment before or after fabrication. Treated tinplate: (1) improves adhesion of external air-drying lacquers; (2) does not affect adhesion of fruit or S-resisting lacquers; and (3) impairs adhesion of phenolic-resin meat lacquers. No effect of Sn thickness was noted in protection against S-blackening, but the treatment was most advantageous on thin plate for rust prevention. *Chemical Abstracts* 40, No. 16, August 20, 1946, p. 4647.

16. Dampening systems

• DISCUSSION OF THE OFFSET PRESS WATER DISTRIBUTION SYSTEM. R. P. Willard. *Printing Equipment Engineer* 73, No. 5, February, 1947, pp. 29, 58, 60, 62, 64, 66 (6 pages). The following suggestions are made in this discussion of the offset press water distribution system: The use of single thickness cloth roller coverings has a definite advantage in the reduction of the undesirable effects of speed changes on quality of printing. The magnitude of changes in centrifugal force with speed variation is less in large diameter rollers than with smaller diameter. An independent water distribution driving mechanism to keep the rollers turning over while the press is at rest, is advantageous because it constantly replenishes moisture lost to the air. Proper consideration given to roller width can eliminate much operating difficulty on the press.

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THE MORT DAMPENER CLEANER. *Printing Equipment Engineer* 72, No. 5, August, 1946, p. 47 (1 page). The Mort Dampener Cleaner is a machine designed to clean dampening rollers for offset or lithograph presses. It is built in different sizes to accommodate various size presses. Its advantages and operation are discussed.

OFFSET PRESSES. H. E. Marsden. *British Patent No.* 574,595. The dampening agent in a lithographic machine is applied by a series of spray nozzles with passages fed separately with liquid under pressure and pressure gas from separate valve-controlled sources. The nozzles are arranged to discharge the liquid and gas into a mixing chamber forming the entry to an enclosed spray guard constructed to confine action of the mixture or mist to a preselected part of the printing plate. *Patra Journal and Printing Abstracts* 9, No. 5, April, 1946, p. 369.

17. Offset press operation

***POINTERS ON PRESS OPERATION. *Fuchs and Lang Litho Letter*, March, 1946. Troubles caused by running of excess ink on the press or using too much drier are discussed. A method is suggested for setting rollers and dampeners correctly. This article warns against habitually using the practice of upsetting of cylinder diameters to help register and points out the damage done by this. Suggestions are given for obtaining good register. *Lithographers' Journal* 31, No. 4, July, 1946, pp. 227, 259 (2 pages).**

***STREAKS. *American Pressman* 56, No. 9, August, 1946, pp. 29-30 (2 pages). Even the best of pressmen have trouble with an occasional streak. Conditions that cause streaks are discussed and directions are given for locating the source of the trouble and making necessary adjustments when a streak does occur.**

Pressure-Pull Indicator. Rosales. "Printing" 70, No. 1, April, 1946, p. 67. The "Joyro" indicator determines the pull across the entire length of a set of rollers, simply by taking different readings at regularly spaced intervals. It consists of a flat, watch-spring steel strip connected to a special tensionometer with a reading dial. "Patra Journal and Printing Abstracts" 9, No. 7, August, 1946, p. 540.

***Setting Offset Plate Rollers. *American Pressman* 57, No. 5, April, 1947, pp. 30-32 (3 pages). If rollers are set properly they will function properly for quite some time. Most pressmen have little trouble setting rollers in a normal manner with normal adjustments, but difficulty is often encountered on presses on which the plate roller sockets are attached to the shaft of the steel vibrators against which they operate.**

*** CURES FOR ROLLER STRIPPING. *Modern Lithographer and Offset Printer* 43, No. 2, Februay, 1947, p. 34 (1 page). Causes of roller stripping include: the use of excessive water fountain etch; paper sizings having an acid reaction or an acid condition of the ink pigment or varnish; and ink emulsification which may be brought about in several ways. The most satisfactory method of overcoming roller stripping is to coat the steel rollers with a material that is resistant to acids used in the offset process, with an**

affinity for grease. Good results have been obtained with a copper coating.

•CORRECTIVE MEASURES FOR ROLLER STRIPPING. Charles F. Geese. *National Lithographer* 53, No. 7, July, 1946, p. 46 (1 page). The usual procedure of treating de-oxidized rollers with a paste of pumice powder and a 5% solution of nitric acid to re-oxidize them is discussed. It is pointed out that these treatments will be necessary every few weeks unless measures are taken to correct conditions causing rollers to refuse to take ink. It is suggested that an oxidizing agent be added to every fountain solution to act as a buffer and stop other chemicals from etching the iron and steel.

18. Scum

•Scum or Tint. E. J. Kelly. "American Pressman" 56, No. 11, October, 1946, pp. 25-26 (2 pages). Among the most common causes of scum are: failure to completely remove coating solutions; over exposure; thin negatives; dirty positives; improper etch; ink that is too thin or greasy; dirty, greasy, or poorly set water rollers, or poorly set dampeners or ink forms. Sometimes the paper or the water may cause a scum. These and other causes are discussed and remedies suggested. Tests are described to determine if scum is being caused by the ink, the paper, or if it is imbedded on the plate. General rules for etching a plate are given.

•Careful Diagnosis and Patience Needed to Overcome Demon Scum. A. P. Reynolds. "Canadian Printer and Publisher" 55, No. 11, November, 1946, pp. 39, 58 (2 pages). There are two types of scum problems, namely scumming and tinting. Scum is defined as ink receptive spots in the non-printing areas of the plate. Tinting is a superficial ink spot that is loosely held on the surface and is not reacting chemically with the metal base or absorbed by hardened colloid. The causes of both and suggestions for their prevention are discussed.

• FURTHER LIGHT ON THE SCUM PROBLEM AFTER THE PLATE IS MADE. Al P. Reynolds. *Canadian Printer and Publisher* 56, No. 3, March, 1947, p. 42, 58 (2 pages). The causes of scum and tinting caused by improper press operation are divided into five groups for discussion: improper damper system adjustments; improper adjustment of ink distribution system; improper adjustment of cylinders; improper fountain dope; faulty ink formulation. The dampening system is placed first in importance. A list is given of the causes of scum discussed in the Lithographic Technical Foundation's text "Offset Plate-Making—Albumin Process."

19. Newspaper printing by offset

•WEB OFFSET PRESSES. *Modern Lithography* 14, No. 7, July, 1946, pp. 26-28, 77 (4 pages). The various sizes and types of web presses in operation today are described and their uses discussed briefly. The types of work best suited for offset web printing are listed. The problem of the setting of inks on a web fast enough to permit folding and other operations without danger of smearing is discussed and solutions suggested. Accompanying illustrations show different types of web offset presses and tell of their use.

• RELIEF, WEB OFFSET PRESSES ANNOUNCED BY DUTRO & SON.

Printing 71, No. 2, February, 1947, p. 71 (1 page). Two new offset presses are being marketed by the Dutro & Son Co. Features of the photochrome press include pre-registering of plates, long life of plates, minimum of make-ready time, accurate register, and side margins. Since the press uses either water or oil ink, the plates do not have to be gummed or rolled up, and there is no water fountain. Three sizes of the firm's web offset press are now available. A two-unit press can deliver an eight-page newspaper in one-color, a four-unit press, an eight-page paper in three colors on one side and one color on the reverse side, or a sixten-page paper in one color. Speeds up to 14,000 per hour are claimed. Commercial work can also be produced on this press.

• NEWSPAPERS BY OFFSET NEED FURTHER RESEARCH. Charles F. Geese. *Canadian Printer and Publisher* 55, No. 11, November, 1946, pp. 38, 58 (2 pages): *Modern Lithographer and Offset Printer* 42, No. 10, October, 1946, pp. 182-3 (2 pages). The advantages of offset as a method for printing newspapers are discussed. However, these advantages are at present largely cancelled out by a great number of process problems that fall into the two general classes, water and plate troubles. Recent developments which hold out hope for the solution of some of these problems through continued research include: a nonprinting area surface that appears to eliminate the oxidation problems; new press plates that give a printing life of a million or more impressions; high speed ink drying equipment, photocomposing machines for type copy; and faster offset presses

• FOR PICTURE NEWSPAPERS IN SMALLER COMMUNITIES, IS OFFSET THE ANSWER? Glenn J. Church. *Inland Printer* 119, No. 1, April, 1947, pp. 42-4 (3 pages). The use of offset lithography for the publication of newspapers in smaller communities is discussed. The procedure of the *Daily World*, Opelousas, Louisiana is described. It is typical of that followed in most plants. Other newspapers using the offset process successfully are cited. Advantages and disadvantages are set forth. One of the advantages is unrestricted freedom in the use of local pictures and news, and in the soliciting and making up of advertisements since the plant with offset equipment can print anything the camera can photograph.

• MULTI-COLOR PRINTING OF NEWS ON THE WAY. Orville Dutro. *Graphic Arts Monthly* 19, No. 4, April, 1947, pp. 20, 22, 70 (3 pages). This article sets forth the opinion that it is within the range of possibilities for any modern newspaper to include in its daily adition at least one or two sections bearing natural color advertising. One of the main difficulties in newsprint is the lack of inherent paper whiteness which is necessary for the reproduction of color. However, it is suggested that possibly this and other problems involved in multi-color newspaper printing might be solved by a "twin process" method of reproduction. What might be accomplished by the use of a "twin process" using the detachable plate rotogravure-Rotograf and offset web presses is discussed.

OFFSET PRINTING TECHNIQUE AND PROBLEMS DISCUSSED. W. Reed. *Editor and Publisher*, 1946, 79 (2), 9, 84 (January 12). The possibilities of offset printing for daily and

weekly newspapers are discussed, with special reference to the minimum equipment necessary, the speed obtainable in producing illustrations, and the difficulities involved in securing or training operatives. *Patra Journal and Printing Abstracts* 9, No. 5, April, 1946, p. 399.

20. Metal lithography

METAL LITHOGRAPHY. W. Hill. *Managing Printer*, 1946, 31 (367), 210, 212 (Sept); (368), 235 (Oct); (370), 290, 289 (Dec.). An outline is given of tinplate printing, with reference to its history, the raw materials used, the production of cans, closures and caps (including adjustable caps) and varnishes, and the drying of lacquers and inks. Account must be taken of the effect of light, heat and varnishing on colour when printing. The use of white printings, the differences between line printing and ordinary litho inks, and the effect of the gum used on the gloss of the varnish are briefly discussed. *Printing Abstracts* 2, No. 2, February, 1947, p. 72.

The Metal Container. V. E. Seymour. "Packaging Review," 1945, 65, (11), 20-3 December. A brief history of printing on metal containers and the development of tin-printing machinery is given, including the introduction of direct colour protography. Future trends of the metal container industry are indicated. "Patra Journal and Printing Abstracts" 9, No. 5, April, 1946, p. 391.

*What the Metal Decorator Should Know About Protective Coatings. M. G. Gardner. Part I, "Modern Lithography" 14, No. 3, March, 1946, pp. 27-30, 89 (5 pages). Part II, "Modern Lithography" 14, No. 5, May, 1946, pp. 75-79, 121 (5 pages). Finishes are applied to the flat metal sheet before can fabrication most often by the roller coating machine, the rotary ress and the doctor blade or rolls. After the container has been formed, coatings are applied by spray, flush, dip or automatic brush and wipe methods. Occasionally the squeegee screen is used. Varnish, lacquer, enamel and various other types of finishes are described. The two classes of container finishes are: exterior, those used on the outside of containers for decorative and protective purposes; and interior, those used on the interior of the containers in which are packaged foods, beverages, tobacco, and other products. Characteristics, application, and uses of size coatings, enamel coatings, inks, and finish varnishes, in the exterior group, are discussed. The interior liners are of two types—the Sanitary Group for use inside food, beverage, and medicinal containers, and the Non-Sanitary Group or chemical resistant liners. The variations of these types are described.

A PROTECTIVE CHEMICAL TREATMENT FOR TIN PLATE. R. Kerr. *J. Soc. Chem. Ind.* 65, 101-4 (1946). Immersion of tin plate for 10-60 seconds at 70-80° in a solution containing 8 g. $Na_2Cr_2O_7$, 20 g. Na_3PO_4, 20 g. NaOH, and 3 g. of a penetrating agent. Dispersol L or Teepol per l. and rinsing in water causes formation of an invisible film preventing blackening by S-contg. foods and retarding rusting in moist air. Exposure, humidity chamber, and cannery tests are discussed. No difference was found between treatment before or after fabrication. Treated tinplate: (1) improves adhesion of external air-drying lacquers; (2) does not affect adhesion of fruit or S-resisting lacquers; and (3) impairs ad-

hesion of phenolic-resin meat lacquers. No effect of Sn thickness was noted in protection against S-blackening, but the treatment was most advantageous on thin plate for rust prevention. *Chemical Abstracts* 40, No. 16, August 20, 1946, p. 4647.

*Cans, Closures, and Caps. Resinous Reporter 8, No. 2, March, 1947, pp. 2-7 (6 pages). The different types of plates used for can fabrication are discussed. Materials which are used in a can vary with the nature of the product to be canned but steel is the base-plate of all types. The importance of metal decorating, i.e., the use of enamels in preventing corrosion or improving appearance cannot be minimized. The characteristics desired in a can coating, and the synthetic resins used in their formulation are discussed. Tests given to measure an enamel's potential value as a metal coating are described.

21. Decalcomania

Flexible Reflex Reflecting Film. Matthew H. Phillippi, assignor to Brown and Bigelow. "U. S. Patent No. 2,403,752" (July 9, 1946). A decalcomania transfer comprising a base sheet, a paste coating thereupon, a flexible base sheet adhered to said paste coating, a multiplicity of closely grouped reflex reflecting elements adhered to said base sheet, and a top coat of transparent material upon said reflecting elements. "Official Gazette" 588, No. 2, July 9, 1946, p. 306.

III. PAPER AND INK

1. Lithographic papers—general

*A REVIEW OF THE LITERATURE RELATING TO PRINTABILITY AND ALLIED SUBJECTS, 1944-1945. S. M. Chapman. *Pulp and Paper Magazine* of Canada 47, No. 3, Convention Issue, 1946, pp. 267-73 (7 pages). Reviews, with 47 references, covering paper properties and printing, printing ink, printing troubles, machine coated papers, effect of temperature and relative humidity, and other allied subjects.

*COMMON TROUBLES WITH LITHOGRAPHIC PAPERS. Robert F. Reed. *Paper Industry and Paper World* 28, No. 12, March, 1947, pp. 1741-43 (3 pages). Paper is an important factor in successful lithography. Its improvement by eliminating contributing causes of lithographic troubles would break certain production bottlenecks and permit increased production and improved quality of work. Much has been accomplished in recent years in the prevention of register troubles through improvements in papermaking and in the handling of paper by lithographers. "Picking" and the measurement of pick resistance and bond strength are still problems which deserve serious thought and research. Ink-drying troubles are partly due to lack of control of ink resistance in papermaking, and a dependable test for this quality is badly needed. Improvements in paper to eliminate causes of scumming and tinting in lithography are desirable. Much will be gained by all concerned through a better understanding of lithographic requirements which can only be brought about by continued research.

• PAPER PROBLEMS. *Modern Lithography* 15, No. 3, March, 1947, pp. 51, 53, 57, 85, 87, 89 (6 pages). This article contains excerpts from the Lithographic Technical Foundation's Shop Manual No. 27 "Paper Troubles in Offset Lithography." It is pointed out that the majority of paper troubles are due to improper handling of this material rather than faults with the paper itself. Paper problems discussed include: picking, fuzz and powder, misregister, misfit, conditioning troubles, static.

Proof-Press Evaluation of Paper. A. T. Gardner. "Pulp Paper Mag. Can." 47, No. 9, pp. 78-9 (1946). Among the properties of paper that can be determined by a proof press are the ease of impression or coverage, ink absorption, and relative strike-through and show-through. "Chemical Abstracts" 40, No. 21, November 10, 1946, p. 6814.

Definition and Measurement of Gloss. V. G. W. Harrison. The Printing and Allied Trades Research Association, London, England. 10/-. An extensive study of the objective and subjective factors in the sensation of gloss. Attempts at practical gloss measurement have followed six different theories. The various methods are described and their advantages and limitations discussed. Much work remains to be done in the direction of correlation of existing methods with one another and with visual judgements. The bibliography contains 180 references.

•EXPERIMENTAL MANUFACTURE OF PAPER FOR WAR MAPS. Charles C. Weber and Merle B. Shaw. *Paper Industry and Paper World* 28, No. 8, November, 1946, pp. 1137-40 (4 pages). A new map paper was developed early in World War II that greatly improved the quality and performance of war maps. The National Bureau of Standards cooperated in the development and, subsequently, determined by experimental manufacture how to make the paper from commercially available raw materials. The best results were obtained in experimental manufacture by using fiber furnishes of 100% strong bleached sulphate pulps with melamine formaldehyde resin for wet strength and titanium dioxide for opacity. It was essential that the beating be very carefully controlled to preserve the maximum fiber strength. The most critical requirements from a manufacturing standpoint were the very high resistance to tear, high wet tensile strength, high opacity, and good smoothness. A moderate degree of wildness was not objectionable. The data obtained by experiments were applied to initiate the commercial production of the new paper to meet unprecedented tonnage requirements.

2. Paper materials

Phycocolloids: Useful Seaweed Polysaccharides. C. K. Tseng. "Colloid Chemistry" 6, 1946, pp. 629-734. A comprehensive paper covering agar, carrageenin, algin, laminarin, their manufacture, chemistry, raw material, and uses. Irish moss, funorin, kelps, Japanese and other processes; gels and their behavior are treated in detail. Uses include foods; baked goods; dairy products; confectionery; pharmacy; cosmetics, bacteriology; dental molds; textile sizings, finishes and fibers; paper; paints; latex. "Chemical Abstracts" 40, No. 8, April 20, 1946, p. 2245.

3. Coated and calendered papers

*TAPPI SURVEY OF PAPER COATING LITERATURE FOR 1945. G. G. Landes. *Paper Trade Journal* 123, No. 7, August 15, 1946, pp. 39-44 (6 pages). One hundred forty-two references are cited of paper coating literature for 1945. These references include both periodical articles and patents, but are limited largely to works found in the better known American scientific journals, or listed in *Chemical Abstracts* or the *Industrial Arts Index*. The two types of coating discussed are distinguished according to the use of the coated paper as: printing papers, or protective and decorative papers.

Starch For Paper Coating. Tappi Monograph Series No. 3, Tappi Coating Committee. 1947. 120 pp. A compilation of up-to-date technical information on starch and its application in the coating field, contributed by authorities on various phases of the subject. There are 21 chapters which cover chemistry of starch, physical testing, application, mixtures with other adhesives, water-resistant coatings, and methods of production of different varieties of starch. Some of the chapters include extensive bibliographies and patent references.

*Starch Usage in the Paper Industry. James P. Casey. "Paper Industry and Paper World" 28, No. 2, May, 1946, pp. 268, 270, 272, 274, 276-9 (8 pages). A rather detailed account of the development of starch usage, and the prospects for future increased uses.

*ZEIN—ITS USE IN COATINGS. T. T. Collins, Jr. *Paper Industry and Paper World* 27, No. 12, March 1946, pp. 1810-1816 (7 pages). Eighty-eight references are listed to papers and patents for formulating lacquers, "hot-melt" or thermoplastic coating, aqueous dispersions, thermosetting combination, and films from zein.

*ZEIN—ITS USE IN COATINGS. T. T. Collins, Jr. *Paper Industry and Paper World* 27, No. 11, February, 1946, pp. 1694-7 (4 pages). Fifty-one references are given which are of interest for formulating lacquers, "hot-melt", or thermoplastic coatings, aqueous dispersions, thermosetting combinations, and films from zein.

*Properties of Saran Coating Latex. G. W. Stanton and W. A. Henson. "Paper Trade Journal" 123, No. 6, August 8, 1946, pp. 48-52 (5 pages).

COATING COMPOSITIONS FOR PAPER AND THE LIKE. Chester G. Landes, assignor to American Cyanamid Company. *U. S. Patent* No. 2,399,489 (April 30, 1946). A coating composition having a pH within the range 4.0 to 7.0 and having a total solids content of from about 20% to 65% by weight comprising a mineral pigment, an alkali metal polyphosphate dispersing agent, starch in amounts of from about 15% to 40% by weight of the dry weight of the pigments, a member of the group consisting of acid-curing ureaaldehyde and melamine-aldehyde condensation products in amounts of from 5% to 50% by weight of the weight of the starch and an acidic curing catalyst for said condensation product. *Official Gazette* 585, No. 5, April 30, 1946, p. 765.

Method of Coating. William Lutton Craig, assignor to R. T. Vanderbilt Company. "U. S. Patent No. 2,355,953 (August 15, 1944). In the manufacture of coated paper with a water resistant

but wettable surface, the improvement which comprises applying to the paper, in an aqueous medium, a coating pigment, a starch adhesive and an emulsion of an ester gum, dehydrating the applied film and breaking the emulsion during dehydration of the coating on the paper. "Official Gazette" 565, No. 3, August 15, 1944, p. 461.

•COATING ON A PAPER MACHINE. Frank W. Egan. *Paper Trade Journal* 123, No. 23, December 5, 1946, pp. 84, 94 (2 pages). Magazines and newspapers will soon all be printed on clay coated paper and in three or four colors. A 5 to 6 pound clay coat can be applied successfully to a paper web on a paper machine and this coating will serve as an excellent base, with proper calendering, for printing. Since clay costs less than pulp, the cost of paper can be reduced. Proper arrangement of the breaker stack, the dryers, the coating machines, the calender and winder is discussed.

Method of Applying Coating Films. Mitchell Wilson, assignor to Frederick H. Levey Co. "U. S. Patent No. 2,405,249" (August 6, 1946). The method of drying a film of a coating composition comprising a solution in a solvent of two polar resins having dielectric constants greater than 3, which comprises establishing an electrostatic field by connecting a pair of spaced electrodes to a source of single-frequency alternating current and vaporizing the solvent from the film by subjecting it to said electrostatic field, one of said resins having its maximum dielectric loss at the selected frequency when the coating composition has a low viscosity and contains the major portion of the solvent and the other of said resins having its maximum dielectric loss at the selected frequency when said solution has a high viscosity approaching dryness whereby a substantially continuous heating effect is maintained during vaporization of the solvent, "Official Gazette 589, No. 1, August 6, 1946, p. 81.

•SUPERCALENDERING OF PAPER. MACHINE COATED PAPER. E. E. Thomas. *Southern Pulp and Paper Journal* 9, No. 11, October 31, 1946, pp. 86, 88, 159 (3 pages). This article describes the fundamental principles governing supercalendar action and its effects on various grades of paper including the conditions to be considered in the attainment of the specific objectives. Information on the various types of filled rolls available and their influence on supering results is also included. Reference is made to the trends in design and operation of supercalendering equipment to keep pace with the machine coating production.

4. Paper conditioning

Paper Conditioning for Offset Lithography. "Lithographic Technical Foundation," 131 E. 39th Street, New York 16. Shop Manual No. 26, 25 cents. An elementary discussion of the principles of paper conditioning, paper-conditioning equipment, and methods usually employed in lithographic plants. Paper can be tested and, if found to have the right moisture content, can be run without conditioning. Preconditioned paper and its advantages are discussed.

Effect of Humidity on Physical Properties of Paper. F. T. Carson. "Circular No. C445 of the National Bureau of Standards," U. S. Government Printing Office, Washington, D. C., January 31, 1944, 12 pages. A re-

view is given of the chief changes in the physical properties of paper brought about by a controlled change in the atmospheric humidity from 15 to 83 per cent relative humidity (R. H.). The data were obtained from work at the National Bureau of Standards. Seven tables and six graphs present the results obtained with eleven papers, showing the variation with humidity in basic ream weight, bursting strength, tearing resistance, folding endurance, tensile strength, and stretch. Paper exhibits hysteresis with respect to atmospheric humidity, since its equilibrium moisture content is less when the equilibrium is approached from a lower moisture content than when approached from a higher moisture content. Bursting strength goes through a maximum between 30 to 50 per cent R.H., as does also tensile strength. Variations of folding endurance, tensile strength, and stretch with machine or with cross direction are shown. The data presented permits correlation with respect to standard conditions of testing, such as those prescribed by the Technical Association of the Pulp and Paper Industry. "Monthly Abstract Bulletin" 31, No. 11, November, 1945, p. 340. (Eastman Kodak Company).

•PUTTING MOISTURE IN ITS PLACE. *Canadian Printer and Publisher* 55, No. 11, November, 1946, pp. 42, 45. 46 (3 pages). Several of the popular types of paper conditioning machines are described. Rules to observe in hanging paper for seasoning to obtain best results are given. A method is suggested for introducing extra moisture into the blowing air of the conditioning machine in order to carry the moisture content of the paper to a point higher than just equilibrium. The amount of time required to season paper is discussed and it is pointed out that, because there are so many variables, it is impossible to estimate accurately. The Lithographic Technical Foundation's Shop Manual No. 1 is recommended for information on controlling paper humidity.

Drying and Conditioning Paper. Hall and Kay Limited, Herbert Kay and Sydney Hall. "British Patent No. 564,-356" (September 25, 1944). Paper is air-dried during manufacture by being heated to a desired temperature by contact with heated moist air and then dried, first, partially and then finally by contact with heated dry or normal air. The paper may be subsequently conditioned by raising its moisture content to a desired degree. Apparatus is described. "Chemical Abstracts" 40, No. 11, June 10, 1946, pp. 3262, 3263.

•TIME LIMIT MAY VARY IN PAPER CONDITIONING. *Canadian Printer and Publisher* 55, No. 11, November, 1946, p. 60 (1 page). This article stresses that the variables affecting the speed of paper conditioning are too great to set a standard length of time for conditioning. Paper should always be tested for the proper condition before unloading. The instrument used for making this test, the Paper Hygroscope, is described and instructions given for its use.

Seasoning Paper. Kay Crabtree. "Canadian Patent No. 435,403" (June 25, 1946). Paper is passed over a chilled metal surface moistened by condensate, and wound into a roll so that each convolution that has been in contact with the chilled surface lies against the next convolution which has not contacted the chilled surface. "Chemical Abstracts" 40, No. 21, November 10, 1946, p. 6816.

5. Curling

*THE CURLING OF LITHOGRAPHIC PAPERS. Robert F. Reed. *Modern Lithography* 14, No. 4, April, 1946, pp. 28-32, 90-1 (7 pages) or *Printing Equipment Engineer* 72, No. 2, May, 1946, pp. 13-17 (5 pages). There are three fundamental types of paper curl: (1) Inherent curl, built into or acquired as a result of improper manufacture or handling: (2) Moisture curl, caused by non-uniform moisture distribution, or by the presence of too much or too little moisture; (3) Structural curl, caused by changes in structure of the paper. These types of curl, the paper properties which aggravate them, and their occurrence in lithographic operations are discussed, together with their identification and methods of prevention.

6. Lithographic inks—general

*ANSWERS TO SOME INK PROBLEMS. G. L. Erikson. *American Printer* 123, No. 5, November, 1946 pp. 24-27 (4 pages). Among the factors involved in the drying of ink are: temperature, humidity, age of ink, amount of ink carried, pressure used when printing, conditioning of press and rollers, and paper. Helpful suggestions are given for the solution of ink drying troubles. Other ink problems that are discussed include mottling, caking and trapping, overprinting, wax and grease films, and color matching.

*TROUBLE SHOOTING ON INKS. G. L. Erikson. *Printing* 70, No. 9, December, 1946, pp. 40-1, 58-4 (4 pages). The following ink problems are discussed: bleeding, color changing, flying or spraying, trouble caused by "dopes," metallic inks, blocking out, printing on heavily waxed paper, imprinting over varnished surfaces, "backing up" problems, the action of ink on rollers, the action of age on inks. Many useful suggestions are given.

*INK PLAYS IMPORTANT PART IN LITHOGRAPHY. Charles F. King. *Inland Printer* 118, No. 5, February, 1947, pp. 49-52 (4 pages). The difficulty in placing the blame when trouble occurs on a job is discussed. It is pointed out that, since ink is usually about the last thing questioned, many plates are ruined before the ink is checked. Among the conditions causing trouble are: doctoring of the ink by the pressman, substitution of pigments by the ink maker, driers containing lead, and variation in the length of runs. It is suggested that an attempt be made to write up complete standards or specifications to which all lithographic inks, regardless of color or any other specific requirements, should conform.

*BLUEPRINT FOR CORRECTING INK PROBLEMS. Russell J. Hogan. *Share Your Knowledge Review* 28, No. 5, February, 1947, pp. 35-41 (7 pages). The opinion is advanced that the pressman should have a thorough knowledge of inks, their correct application and suitability for the press and the job being produced, and how to correct ink problems which may occur in the pressroom. A list of 44 ink troubles is given. The nature of the difficulty is described, identifying characteristics are listed, a method is given for detecting the specific trouble, and then the possible reason and possible remedy are discussed for each trouble listed.

• PRESSMEN AREN'T INK CHEMISTS. Charles F. King. *Inland Printer* 118, No. 6, March, 1947, pp. 51-53 (3 pages). Since the formulation of lithographic inks is a complicated procedure requiring technical training and experience, color matching within the plants should be eliminated unless an especially trained man is available. Properties of inks to be considered both in planning a job and in matching of the colors upon the press are: transparency, permanence, alcohol resistance, lacquer resistance, alkali resistance, and resistance to acid. Since transparency is perhaps the most important as far as outlining the make-up, sequence of colors, and register of the job, and since few lithographers have a clear conception of the differences between transparent and opaque inks, illustrations are given showing how these inks differ. Special requirements of specific jobs are discussed.

Printing Ink. John W. Kroeger and Harry F. O'Connor, assignor to F. H. Levey Company, Inc. "Canadian Patent No. 432,154" (December 25, 1945). The ink comprises a pigment and a vehicle consisting of a mixture of non-resinous, thermo-setting liquid condensates of a monohydric phenol or its C-alkylated products with HCHO admixed with a polyhydric alcohol. The liquid keeps its liquidity and chemical composition on standing at normal temperatures, but forms into a solid resin at elevated temperatures. "Chemical Abstracts" 40, No. 7, April 10, 1946, p. 2010.

Lithographic Printing Ink. Dominic J. Bernardi and Robert T. Florence, assignors to Interchemical Corporation. "U. S. Patent No. 2,406,795" (September 3, 1946). A lithographic printing ink which shows considerably reduced greasing as compared to a similar ink made with bodied linseed oil, comprising pigment dispersed in a vehicle, the essential basis of which is the ester of pentaerythritol and tall oil, the ratio of ingredients being such that the composition has the typical stiff body of lithographic printing inks. "Official Gazette" 590, No. 1, September 3, 1946, p. 73.

Printing Ink. Ernest D. Lee, assignor to Interchemical Corporation. "U. S. Patent No. 2,409,215" (October 15, 1946.) A heat drying printing ink comprising pigment dispersed in a vehicle which comprises a solution of coal resin free from coal in a petroleum hydrocarbon solvent which is substantially non-volatile at 20°C. and which volatilizes very rapidly when heated to temperatures of the order of 150° C., said coal resin comprising the portion soluble in hexane and lower saturated hydrocarbons of the resin concentrate consisting of resin admixed with coal and obtained from a resin-bearing coal of the Utah type. "Official Gazette" 591, No. 3, October 15, 1946, p. 397.

• STRUCTURE AND MAKEUP OF PRINTING INKS. Ted Prime. *American Ink Maker* 25, No. 1, January, 1947, pp. 37, 39, 53 (3 pages). The principal materials used in ink manufacture may be divided into three classes: vehicles, pigment, and drying agent. These are discussed. The ink maker must know both the chemical and physical properties of the materials he works with and what he can expect when he mixes these materials. The trend is toward fast setting inks, examples of which include gravure inks, heat-set inks, and moisture-set inks. The properties and uses of these various inks are described.

7. Ink materials and structures

RESINS FOR PRINTING INKS. H. A. Idle. *Oil and Colour Trades Journal*, 1946, 109 (2464), 36, 38 (January 4). The testing of resins for printing inks is briefly discussed. The solubility of resins, adhesion, and flexibility are considered as they affect the use of resins for printing inks. Pigment resin reactions, stability of the ink in storage, weathering and soap resistance imparted by resins are also covered. *Patra Journal and Printing Abstracts* 9, No. 5, April, 1946, p. 350.

8. Drying oils

Drying Oils and Method for the Preparation Thereof. Fred J. Stark and George H. Slack, assignors to Fred J. Stark, George H. Slack, R. M. Rutledge, and Harry A. Hirst. "U. S. Patent No. 2,399,697" (May 7, 1946). A method of producing a drying oil which comprises chlorinating a soy bean oil by the action of nascent chlorine and then subjecting the reaction product to the action of nascent oxygen. "Official Gazette" 586, No. 1, May 7, 1946, p. 76.

9. Pigments

• NOTES ON COLORING POWER OF PIGMENTS. Henry L. Beakes. *Paint, Oil, and Chemical Review* 110, No. 9, May 1, 1947, pp. 15, 36, 38-39 (4 pages). Coloring power is distinct from tinting strength. Coloring power is concerned with change in hue, tinting strength with change in saturation and brightness. Some of the numerous pigment tests necessary in evaluating pigments are described. The use of a Hunter Reflectometer in making these tests is discussed. Data sheets are given showing test results.

• MATCHING LITHO COLORS. Charles F. Geese. *National Lithographer* 54, No. 3, March, 1947, p. 40, (1 page). It is pointed out that in ordering inks, it is important to state that the ink is to be used for offset printing because in offset printing you actually print the in-between tonal value rather than the over-tone or full strength value. Three conditions to avoid in matching colors are: dirty dampeners, which will distort a color match badly, poorly set ink rollers that cause the ink to emulsify, and unbalanced amounts of ink and moisture used, which have a tendency to weaken the color value. The pressman must have color knowledge and color knowledge starts with a basic understanding of color cleanliness. It is suggested that the best system of color understanding can be learned from an ink sample book. A plan is outlined whereby ink matching can be simplified.

10. Ink testing and control

Dispersions of Finely Divided Solids in Liquid Media. Earl K. Fischer and David M. Gans. "Colloid Chemistry" 6, pp. 286-327 (1946). Pigments, paints, and printing inks are examples of the solids and liquids and modifying agents dispersed by many types of apparatus. Following a two-page glossary is a discussion of: the liquid phase, the comminuted phase (particle size table, electron micrographs), mechanical dispersion (descriptions of mills and operation, roll mills, ball and pebble mills, relative charge volumes of balls to mix, ball size, and rate of dispersion and contamination, mill diameter and dispersion rates; the colloid mill); the solid-liquid interface; rheological properties (with table); sedimentation equilibria; contact-angle

relations; heat of immersion; adsorbed water; surface-active agents (two pages of tables). Flushed colors, involving direct transference from aqueous to oil dispersion without drying are treated. "Chemical Abstracts" 40, No. 9, May 10, 1946, p. 2374.

• RHEOLOGICAL PROPERTIES OF PAINTS, VARNISHES, LACQUERS, AND PRINTING INKS. Henry Green. *Journal of Colloid Science* 2, No. 1, February, 1947, pp. 93-98 (6 pages). A general discussion of the problems of consistency measurement and control of products of the pigment-vehicle type.

INK CONSISTENCY TESTER. *Instruments* 20, No. 4, April, 1947, p. 304. New "Model C-46 Inkometer" for measuring effective consistency of lithographic and printing inks, embodies an ink-film dynamometer; A delicately balanced pendulum involving a hollow brass roller and a composition roller is first "zeroed" without ink; an ink sample of standard volume is applied to rollers; resistance is measured by a sliding weight on a scale beam. Standard temperature is maintained by circulating water from a thermo-regulated bath through hollow brass roller. Composition rollers may be coated with whatever material is used on ink rollers of presses. Press speeds are also simulated. "Model C-46" produces speeds of 400, 1200 and 2000 rpm., or peripheral speeds of 314, 942 and 1570 fpm. Thwing-Albert Instrument Co., Penn St. & Pulaski Avenue, Philadelphia 44, Pennsylvania.

• A VARIABLE SPEED ROTATIONAL VISCOSIMETER. R. Buchdahl, J. G. Curado, and R. Braddicks, Jr., *Review of Scientific Instruments* 18, No. 3, March, 1947, pp. 168-172 (5 pages). The article gives a detailed description of design and construction of a variable speed rotational viscosimeter to measure the rheological properties of system within a viscosity range of 10^{-1} to 10^{4} poise. The use of a strain gauge to measure the torque is discussed briefly.

•Experiments of Wetting and Dispersion. W. Carr. "Paint" 16, No. 6, June, 1946, pp. 190-2 (3 pages). Although the war years did not see the introduction of any new surface-active agent, the viewpoint was finally accepted that control of the degree of dispersion rather than an attempt at ideal dispersion is essential for commercial plants. The variation in the degree of dispersion can be followed by examining the rheological or flow properties of the mixture, the study of which has made considerable progress. By summarizing the chief researches on the subject, this article provides an introduction to further study on the lines suggested.

• CONTACT ANGLE MEASUREMENTS IN LITHOGRAPHIC RESEARCH. John E. Barkley. *American Ink Maker* 25, No. 2, February, 1947, pp. 24-26 (3 pages). The use of contact angle measurements in studying various relationships between fountain solutions and lithographic printing inks is discussed. The bubble method of measuring contact angles is described in detail. Tables are given showing representative data obtained from contact angle measurements made on six lithographic inks for various pH values of fountain solutions, and giving the formula of the standard stock solution, varied dilutions of which are used to obtain the variation of pH values of the fountain solutions.

*The Hegman Fineness Gauge. Dr. J. M. Purdy. "Paint, Oil and Chemical Review" 109, No. 17, August 22, 1946, pp. 14, 16 (2 pages). The design and use of both the original and the new Hegman Fineness Gauges for measuring the fineness of grind of pigment pastes are discussed. Illustrations are given.

11. Paper and ink relationships

*THE SPEED OF PENETRATION OF PRINTING INK INTO PAPER. Andries Voet and John S. Brand. *American Ink Maker* 24, No. 11, November, 1946, pp. 33-4, 61 (3 pages). The following conclusions, reached as a result of tests made with regard to the speed of penetration of printing ink into paper, are discussed: vehicle coloration does not interfere in a marked way with penetration measurements; the penetration speed of an ink is in direct proportion to the fluidity of the ink vehicle and independent of the ink viscosity; its temperature effect is completely governed by vehicle fluidity; no direct connection seems to exist between ink penetration speed and vehicle surface tension; in practical inks the pigment concentration hardly effects the penetration speed but inks and ink vehicles behave fundamentally different on penetration into paper; complex but homogeneous vehicles penetrate as a single liquid. A method is described for accurately determining the penetration speed of inks into paper.

*PENETRATION OF INKS INTO PAPER. Dr. Andries Voet. *American Ink Maker* 24, No. 3, March, 1946, p. 27 (1 page). Conclusions reached as a result of tests on a number of inks and paper are discussed. Among these conclusions are: the penetration speed of an ink in paper is governed solely by the fluidity of the vehicle and is directly proportional to this value, irrespective of ink viscosity; and a complex but homogeneous vehicle does not show any preferential penetration of the lighter vehicle constituents, but the vehicle always penetrates as a single liquid.

*SPEED OF PENETRATION OF PRINTING INK INTO PAPER. Andries Voet and John S. Brand. *Paper Trade Journal* 122. No. 24, June 13, 1946, pp. 34-9 (6 pages). When a printing ink has been printed on an absorptive paper, the pigment part either remains completely on the paper surface or is embedded in the upper paper layers, while the vehicle part is drained off by the paper. The rate with which this latter process occurs is of great significance for the setting of printing inks. A photoelectric method of measurement of this penetration speed is given and some of the results obtained are discussed.

* FORECASTING PRINTABILITY BY OIL ABSORPTION MEASUREMENTS. V. V. Vallandigham. *Paper Trade Journal* 123, No. 17, October 24, 1946, pp. 39-41 (3 pages). Since the receptivity or resistance of a paper surface to printing ink vehicles is a factor of major importance in controlling the printability of that sheet, a test apparatus to measure that property would be very useful in evaluating papers and aid in the selection of the proper type printing ink. The Photo Electric Absorption Meter was developed by the author to evaluate the degree of efficiency of paper surface sized with an oil resistant material. Test results are given for several papers to indicate the usefulness of the instrument.

*Heat-Set Offset Web Printing. "American Pressman" 56, No. 10. September, 1946, pp. 28-30 (3 pages). The development of "instant" drying heat-set inks for the offset printing process is discussed. Without these rapid drying inks the use of coated paper was limited because the ink film remained on the surface of the paper and the smearing problem appeared. Absorbent paper was used but, because the ink penetrates this paper, the color values suffered. "Vapolith," the offset heat-set ink developed by International Printing Ink, and the drier developed by the Selas Corporation which permits heating both sides of the web at once and then cools the paper over water-cooled rolls before the web is led to the folder, are discussed. Illustrations show different types of driers and the installation of driers on various types of presses.

12. Paper and ink research

*PAPER AND INK CORRELATION. Dr. F. H. Frost. *American Ink Maker* 24, No. 11, November, 1946, pp. 30-1, 63 (3 pages). In a recent survey made by the Lithographic Technical Foundation, lithograpers indicated that the following problems should have top priority in research programs; ink drying, chalking, scumming, water absorbency, picking, splitting, offset, stretch, curl, reverse embossing, hooking at the tail end of the sheet, dimensional stability, mottle, printing quality, waviness of paper and uniformity of absorbency. The close relationship between all these problems and the necessity for cooperative effort by ink manufacturers and paper manufacturers for their best solution are discussed. A method is suggested for securing the most effective cooperation.

*RESEARCH AND THE PRINTING INK INDUSTRY. I. M. Bernstein. *American Ink Maker* 24, No. 6, June 1946, pp. 25-26 (2 pages). This article tells of the growth of research in the printing ink industry from research by individual companies to the present, when this individual research is supplemented by industry research. The setup and purpose of the National Printing Ink Research Institute at Lehigh University are discussed.

IV. LITHOGRAPHY—GENERAL

*SCANNING THE LITHOGRAPHIC HORIZON. W. H. Wood. *Harris Impressions* 7, No. 2, March-April, 1947, pp. 1, 2, 3 (3 pages). The possible avenues which lithographic development may follow in the future are discussed. Sooner or later the graphic arts will arrive at some form of continuous tone reproduction suitable for long runs and the halftone dot will be eliminated. A more immediate improvement, however, will be the use of "point light sources" for sharper images. Factory-coated plates, coated on a "vertical-trough" coater, and the use of coatings sensitive to particular wave lengths of lights are logical directions for research on coatings to take. Bimetallic plates which will permit dry offset lithography, and the elimination of negatives are clearly within the realm of future possibilities. Stereoscopic pictures without need of a viewer, electronic color filters, instantaneously dry-

ing press inks, and a synthetic paper insensitive to water are already in the laboratory stage. It is suggested that it may be posible in the future even to make use of invisible radiations to expose each sheet in a pile simultaneously. To carry the idea further each sheet might contain layers of liazo emulsion sensitive to a particular form of radiation to allow color separation negatives to be projected one after another into the pile with perfect register.

*REVOLUTIONARY REALITIES AND IMMINENT DEVELOPMENTS IN THE PRINTING INDUSTRY. J. L. Frazier. *Inland Printer* 117, No. 2, May, 1946, pp. 31-37 (7 pages). The author describes some of the new ideas and developments in the lithographic industry which include: the use of plastic plates, the utilization of the "electric eye" in various instruments in the lithographic field, a step and repeat machine for letterpress, the increasing use of the camera in printing and photocomposing machines being developed, and a press which will print from relief, intaglio, or planographic plates as desired.

* BEGINNERS' PROBLEMS IN LITHOGRAPHY. Charles F. King. *Inland Printer* 119, No. 1, April, 1947, pp. 75-77 (3 pages). It is pointed out that the problems of lithography are peculiar to that process and are entirely different from those found in any other form of printing. Before a letterpress printer goes into lithography, he should understand the capabilities and limitations of the process. This article traces a job from copy to finished press sheets in both processes to see in what respects the two differ.

* LACK OF KNOWLEDGE OF THE FUNDAMENTALS STILL HAMPERS OFFSET PROCESS. Charles F. King. *Inland Printer* 118, No. 4, January, 1947, pp. 51-54 (4 pages). It is pointed out that, since so little is known about the basic principles of the lithographic process, all that can be done is to attempt to standardize materials and operations on the basis of experience. This article presents some observations of the action of fountain water, ink, and other materials and their effect upon press operation. PH control and its value are discussed.

*ADVANCES IN THE CHEMISTRY OF THE OFFSET PRINTING PROCESS. William H. Wood. *American Pressman* 56, No. 10, September, 1946, pp. 27, 30 (2 pages). Some of the new alloys of zinc and aluminum for plates that have recently become available are briefly discussed. Developments in the chemistry of the offset printing process include: new counter etches, several new products for making surface or albumin type plates, new colloid materials for deep-etch coatings, gum substitutes, improved drying oils, synthetic rubbers for blankets and rollers made from the chlorinated styrene type rubbers, high wet strength papers, and Diazo compounds used in light sensitizing.

* OFFSET. Norman A. Mack. *Printing Equipment Engineer* 74, No. 1, April, 1947, pp. 24-25 (2 pages). To its detriment the offset lithographic process has been sold as a cheap process. This article points out that, because of its wide range and flexibility, any kin of work up to high grade work done i six colors may be done by the offse

lithographic process, as well as cheap work. Skilled craftsmen are required however. Developments mentioned include: the plate developed by *Time* and *Life* from which it is anticipated 2 million impressions may be obtained without the use of a dampener system of any kind; and the Electronic Plate. Also discussed are: the damping problem; difference between photo-engraving and offset screen work; dry offset; development of web-offset; stunt work by offset; and maxium albumin plate life.

•PHOTO-MECHANICAL DEVELOPMENTS. W. C. Huebner. *National Lithographer* 53, No. 10, October, 1946, pp. 36, 72 (2 pages) or *Lithographers' Journal* 31, No. 7, October, 1946, pp. 434, 471 (2 pages). The growth of offset printing since 1906 is discussed. The help given to the lithographic industry by the Lithographic Technical Foundation is mentioned. Suggestions made for further improving the industry include: dry offset; the elimination of graining plates and the gumming procedures when the press stops; one shot, one plate, four-color cameras; colorvalhue-matchers; straight line image reversing cameras; page making equipment and processes; phototextype composing machines; short run multicolor rotary proof presses; cylinder making equipment, unified printing presses; and new and faster finishing equipment.

•MODERN LITHOGRAPHY. Al P. Reynolds. *Canadian Printer and Publisher* 55, No. 9, September, 1946, pp. 45, 62 (2 pages). The growing trend for management as well as the skilled craftsmen to take an active interest in the technical phases of offset lithographic reproductions is commended. Attention is called to the value to the lithographic industry of the work done by the Lithographic Technical Foundation and it is stressed that the new materials and techniques be put to use in the industry. Cellulose gum is discussed and the fifteen reasons why it is superior to gum arabic are listed.

• NEW DEVELOPMENTS AND PRODUCTS. *National Lithographer* 54, No. 1, January, 1947, pp. 28, 29 (2 pages). Some machines and processes developed or improved during the past year are discussed. These include: the Electron Intaglio Process; the new Harris LTN Offset Press reported to be one of the fastest running presses ever manufactured; the new Hoe Six-Color Sheet Feed Paper Offset Press; Redi-Lith Ink; Davidson Paper Masters; new Miehle 61 and 76 presses; two new Lawson cutting machines; the new line of deep-etch chemicals of the Litho Chemical and Supply Co.; Kodalith Orthochromatic Film Type II; improved Premium Graph-O-Lith Developer; and Detecto Fraud-Proof Label Paper.

•BACK TO FUNDAMENTALS. *National Lithographer* 53, No. 6, June, 1946, p. 43 (1 page). A brief discussion is given on how to obtain a halftone negative by means of partial exposures through several apertures or openings of the lens. Brief instructions are given for determining the correct amount of ink needed on rollers by working from the fountain. The job should never be started with the ink knife.

•BACK TO FUNDAMENTALS. *National Lithographer* 53, No. 7, July, 1946, p. 39 (1 page). The use of cellulose gum as a substitute for gum arabic is briefly discussed. Submission of photo proofs of a job for customer's OK is advocated. The two most common methods for making these proofs are called "Van-Dykes" and "Photo Prints". The necessity for adjusting amount of acid in water fountain etch for jobs requiring heavy or light ink coverages is pointed out.

• BACK TO FUNDAMENTALS. *National Lithographer* 53, No. 12, December, 1946, pp. 34, 58 (2 pages). A system is suggested of recording the filters used when making a set of color separated negatives in order to be able to later distinguish the color recorded by each negative. In order to produce the best results when producing a set of color-separation negatives, the whole set should be developed at the same time. The causes and treatment of spots on a plate are discussed. A method of checking pressure between the blanket and plate to ensure that a minimum of pressure is being used is described.

• PHOTOMECHANICAL REVIEW. J. S. Mertle, *National Lithographer* 54, No. 1, January, 1947, pp. 34, 77 (2 pages). Trivision prints, the indirect process, rapid fixing baths, and deep etch plates made by using the new Electron Intaglio Plate are discussed.

LEADERSHIP TRAINING IN OFFSET LITHOGRAPHY. Phillips Austin. *Special Subject Text No. 413, Lithographic Technical Foundation, Inc.*, 131 East 39th Street, New York 16, New York. Price $1.00. A text prepared for foremen, supervisors, and heads of departments in lithographic plants. It covers responsibility, employee relationships, production control, waste control, health and accident hazards, and places emphasis on maintenance of high morale.

•Plastic Sheets in Litho Production. D. P. Barnette. "Modern Lithography" 15, No. 2, February, 1947, pp. 26-30 (5 pages). The various sizes and types of plastic sheets are described. The methods used in the Coast and Geodetic Survey reproduction plant to expedite the processes connected with chart and map reproduction are discussed with the idea that these may prompt the usage of plastic sheets in the general field of lithography. The plastic negative is easily prepared and easily corrected. The resulting plates are strong, sharp, and uniform and more economical than is possible by any other means.

•New Plastic Films—Their Packaging Qualities. Capt. William H. Aiken. "Share Your Knowedge Review" 27, No. 12, August, 1946, pp. 21-23 (3 pages). Properties that must be considered in evaluating a film for a specific use are: toxicity, taste and odor, strength characteristics, elongation, plasticizer retention, low-temperature characteristics, blocking characteristics, heat sealing, surface characteristics, static accumulation, transparency, greaseproofness, gas transmission, waterproofness, water-vaporproofness.

Gauges and Instruments. "Shop Manual No. 19, Lithographic Technical Foundation," 131 East 39th Street, New York 16, New York. 25 cents. Instruments for measurement of the following variables are

discussed: temperature, time, weight, volume, density of liquids, optical density, light intensity, light volume, relative humidity, length and thickness. Methods and equipment for measurement of alignment, ink consistency, pH value and surface strength of paper are also discussed.★★

1. Technical discussions

• PHILADELPHIANS HOLD "QUIZ NIGHT". *National Lithographer* 54, No. 2, February, 1947, pp. 30-1, 78, 81 (4 pages). This article consists of some of the questions brought up at the Philadelphia Litho Club "Quiz Night", and the answers given on dot etching, streaks, negative making, magenta screens, embossing, blanket troubles, ink troubles and other varied lithographic subjects.

LNA MEETS AT ATLANTIC CITY: RE-ELECTS LODER PRESIDENT (TECHNICAL PANEL). *Modern Lithography* 14, No. 6, June 1946, pp. 28-30 (3 pages). The members of the Technical Panel are listed. The discussion of this panel covered the following subjects: cameras, film, phototypesetting, cellulose gum, grain, photocomposing machines, new plates, presses, new roller, ink, and paper.

•Craftsmen's Convention. "Printing Equipment Engineer" 72, No. 6, September, 1946, pp. 13-23 (11 pages). Resume of papers and clinics at the Craftsmen's Convention at Montreal, September, 1946.

• LITHOGRAPHERS' TOWN MEETING, PART II. *National Lithographer* 54, No. 1, January, 1947, pp. 32, 33, 82, 83 (4 pages). This is the second part of a transcript of the Technical Panel Discussion that took place at the convention of the Lithographers National Association. Discussed in this part are: photo-typesetting machines; masking; and the use of cellulose gum as a substitute for gum arabic in lithography.

• LITHOGRAPHER'S TOWN MEETING. *National Lithographer* 54, No. 2, February, 1947, pp. 32-3, 72, 74 (4 pages). This is the third part of a transcript of the Technical Panel Discussion that took place at the convention of the Lithographers National Association. Discussion in this part was on the following subjects: work done at the Lithographic Technical Foundation on the standardization of graining and on the modified Cronak process; photo-composing machines, advantages of controlled temperature and humidity in the plate department; German plates; and the use of Ansco color paper for color proving.

• LITHOGRAPHERS' TOWN MEETING. *National Lithographer* 54, No. 4, April, 1947, pp. 54, 55, 98-101 (4 pages). This is the fourth part of a transcript of the Technical Panel Discussion that took place at the convention of the Lithographers National Association. Discussed in this section are new developments along the lines of presses, papers, and inks.

2. Lithographic research

•HOW LITHOGRAPHERS CAN PROFIT FROM PRESENT RESEARCH. *Modern Lithography* 14, No. 8, August, 1946, pp. 32, 39, 41, 43 (4 pages). The importance of research

in the growth of lithography is stressed. The four types of technical service needed by lithography, the benefits to be derived from these various services, and the means by which those directly or indirectly concerned with the lithographic process will benefit from the Lithographic Techincal Foundation's research are discussed.

• RESEARCH ON LITHOGRAPHIC PROBLEMS MUST CONCENTRATE ON FUNDAMENTALS. Charles F. King. *Inland Printer* 118, No. 5, February, 1947, pp. 46-7 (2 pages). The research programs of PATRA and the Lithographic Technical Foundation are discussed. The author favors PATRA's program of attempting to discover the actual scientific principles on which the lithographic process operates. His opinion is that the Lithographic Technical Foundation's project on graining should deal with the function of grain and with the physical and chemical properties necessary in plates, rather than with the standardization of present graining methods. Their project on desensitization, he believes, should study the chemistry or mechanics of the process, letting the trade find suitable materials.

3. Lithographic Technical Foundation

•THE LITHOGRAPHIC TECHNICAL FOUNDATION—ACHIEVEMENTS AND PROGRESS. Charles W. Frazier. *National Lithographer* 53, No. 10, October, 1946, pp. 32-3, 78, 80 (4 pages). The establishment of the Lithographic Technical Foundation is described. Some of its projects mentioned in this article which have provided benefits for the industry include the research on paper, the research on rubber blankets, and the publication of manuals, texts, bulletins and training courses. The need for an increased budget for both the research and educational activities is discussed and lithographers are urged to support the Foundation by maintaining an annual sustaining membership. The policies of the Lithographic Technical Foundation are briefly set forth.

4. Book production

•BOOK PRODUCTION REQUIRES SPECIALIZED TECHNIQUE AND KNOWLEDGE. Meric K. Dutton. *National Lithographer* 53, No. 4, April, 1946, pp. 26-7, 80, 82 (4 pages). The progress of offset lithography as applied to the production of fine books is discussed. Education of the publisher and his artist in the need of consulting with the lithographer before planning details of a book to be produced by offset is stressed. Some of the fundamentals of book design are enumerated, such as: width or margins, alignment of lines on pages, uniformity of color, reproduction of different faces of type, paper quality. The binders' problems are considered as they affect the lithographer. The offset printer should have a clear understanding with the customer on such points as the ownership of negatives, ownership of plates and other points peculiar to the lithographic industry.

5. Plant layout

•SOME IDEAS FOR THE NEW PLANT. I. H. Sayre. *Modern Lithography* 14, No. 4, April, 1946, pp. 24-26, 93 (4 pages). Two plans are discussed that offer helpful suggestions in arrangement of an efficient camera department and diagrams showing de-

tails are given. The darkrooms for exposure and development are separated to make possible full-time use of both camera and developing room. Suggestions are made to construct walls and partitions to steel beams supporting floor and thus preventing any loss of space and impediment from them. The contact room layout is also described. Recommendations are given for the elimination of doors in favor of light traps, the layout of the developing sinks, and tables for examination of negatives and positives.

*SOME IDEAS FOR THE NEW PLANT. I. H. Sayre. *Modern Lithography* 14, No. 5, May, 1946, pp. 42-4 (3 pages). A basic floor plan is given for art and camera departments, using only an average floor area, to illustrate how to eliminate as much traveling around the plant as possible by having the needed items in each department with an easy working area around each piece of equipment. Diagrams show the design and layout of etching table and etching sinks. The details of these are also discussed briefly.

*SOME IDEAS FOR THE NEW PLANT. I. H. Sayre *Modern Lithography* 14, No. 8 August, 1946, pp. 24-26 (3 pages). Suggestions are given for platemaking equipment and floor layout. The importance of maintaining cleanliness and order in the platemaking department, and the undesirability of standing water in the sinks or on floors, are stressed. Desirable arrangements for the photo-composing machine, developing table for deep-etching plates, examining and finishing tables, and the proof press are discussed. Suggestions are made for layout of materials and equipment for the staging operation. Illustrations are given for floor and equipment layout.

*PLANNING THE OFFSET DEPARTMENT. R. Ernest Beadie. *Inland Printer* 118, No. 2, November, 1946, pp. 63-66 (4 pages). A superintendent should be in charge of production activities; all work funnels from the sales and planning departments through his office. A schedule of work on hand or in prospect should be drawn up and production based upon it. Suggestions are given for the layout of departments and items in each department to permit the continuous motion in one direction. The advantages and disadvantages of having a platemaking department in the plant are weighed. Equipment and materials necessary in a platemaking department are listed and their efficient arrangement discussed. This article points out the necessity of having the presses, platemaking equipment, and camera installations in three separate departments. Layout illustrations are given.

*PLANNING FUTURE PLANT AT COPIFYER LITHOGRAPH CORPORATION. *Printing Equipment Engineer* 72, No. 3, June, 1946, pp. 9-19 (11 pages). This article discusses the equipment layout planning problem previous to moving an offset-litho plant and its personnel into a new building as approached by the Copifyer Lithograph Corporation. It covers the methods by which the interest and ideas of entire plant personnel were secured and the control methods employed in regular production. Sketches are given showing final layout of the plant.

• DEVELOPMENTS IN THE GRAPHIC ARTS—1945. Robert H. Simmons. *Paper Trade Journal* 123, No. 24, December 12, 1946, pp. 27-34 (8 pages). Developments in the graphic arts during 1945 were mainly in the nature of progress and expansion of methods and processes already in use. Developments were classified into the following groups for discussion: paper, printing inks, printing processes, newspapers, plastics, photocomposing, photography, offset printing, silk screen process, adhesives, fluorescent light, electronics and infrared, research, and miscellaneous.

•TECHNOLOGICAL IMPROVEMENTS IN THE GRAPHIC ARTS. Excerpts from talk by Joseph Rosenberg before American Museum of Photography Symposium in Philadelphia. *Lithographers' Journal* 31, No. 4, July, 1946, pp. 226, 277 (2 pages). New processes and instruments of interest to engravers mentioned include: electronographic printing; the Phototextype, a camera composing machine; the Electronic Engraver by which esgravings may be produced without benefit of negative or etching acid; camera equipped with a self-regulating electronic device that will gauge and supply proper amount of light for a given subject; and photographic methods of printing.

• MUSIC PRINTING. *British and Colonial Printer* 140, No. 952, January 17, 1947, p. 40 (1 page). Music printing is more closely connected with engraving than with lithography. Quite a lot of music is still produced by the hand stamping process using pewter plates. However two other methods now being used, both photographic, are: preparation of paper negatives direct from the plates; and the normal photographic reproduction of a correctly drawn copy and the make-up of a printing plate by photolitho methods from the resultant negative. The platemaker for this type of printing must have an extremely good knowledge of music.

• MECHANICS OF A GREETING CARD. Thomas P. Mahoney. *Printing Equipment Engineer* 73, No. 6, March, 1947, pp. 34, 42, 44, 46 (4 pages). The procedure for producing greeting cards is described. They are usually reproduced in four, five, or six colors, and lithography is usually just the first step in a series which takes in one or more letterpress operations involving electrotypes, brass dies, cutting dies and other plates. The slik screen process is used for reproduction when the runs are short or where a special effect is to be obtained. A small percentage of greeting cards is reproduced by photogravure.

•PHOTO-ENGRAVERS RESEARCH, INC. J. Homer Winkler. *Photo-Engravers' Bulletin* 36, No. 4, November, 1946, pp. 46-52 (7 pages). Attention is called to the low percentage of research being done by the printing industries in comparison with that being done by other industries. It is pointed out that the industries that have grown the most during the last ten years are those that have had the highest research expenditures. The organization of Photo-Engravers Research, Inc. and the work being conducted there are discussed. The Lithographic Technical Foundation, the Institute of Paper Chemistry, The Book Manufacturers Institute, and other

groups carrying out research in the printing industry are commended.

***Is Photo-Engraving Chained to Flat Plates?** Bruce Wale. "Photo-Engravers' Bulletin" 36, No. 4, November, 1946, pp. 18-21 (4 pages). It is pointed out that whether or not flat plates continue to be necessary in photo-engraving depends not on the photo-engraver, who can make almost any kind of photo-engraved plate desired, but on the manufacturers of printing presses. The six characteristics desired in a photo-engraving for best results are discussed. Condensed specifications are given for the various model Wale Rotary Presses, designed by the author.

"Alterproof" Paper Having Negative and Positive Designs on Opposite Sides. J. D. Ross, assignor to International Business Machines Corporation. "U. S. Patent" No. 2,396,391. Made by coating a pair of similar electro rollers wth light-sensitive material, covering the rollers with films having negative and positive images of the design, exposing the rolls to light, etching them, and then using the rolls to print paper passed between them. "Monthly Abstract Bulletin" of the Kodak Research Laboratories 32, No. 10, October, 1946, p. 357.

Transfer Material. William Heinecke and Frieda Heinecke, assignors to The Di-Noc Manufacturing Company. "U. S. Patent No. 2,409,564" (October 15, 1946). A composite transfer sheet comprising in combination a bottom base sheet of paper; a sheet of ethyl cellulose coated on the upper face of said base sheet; a photo-sensitive layer on the upper face of said sheet of ethyl cellulose, and a top layer of vinyl resin. "Official Gazette" 591, No. 3, October 15, 1946, p. 481.

METHOD OF FORMING A DRAWING SURFACE. G. F. Nadeau, E. H. Hilborn and C. S. Hunter, assignors to Eastman Kodak Company. *U. S. Patent* No. 2,386,626 (January 30, 1943). A method of forming a drawing surface comprises dissolving soluble salts from a preformed cellulose ester sheet containing insoluble crystalline particles. This results in deepening the craters between the insoluble particles and therefore increases the "tooth" of the surface. *Kodak Monthly Abstract Bulletin* 32, No. 2, February, 1946, p. 62.

See I, 9. Weting agents (Photo-Mechanical Review).

1. Technical processes

***Ilford Process Manual.** R. B. Fishenden. "Modern Lithographer and Offset Printer" 42, No. 9, September, 1946, pp. 163-4 (2 pages). The fourth edition of L. P. Clerc's book "Ilford Manual of Process Work" is reviewed. The chapter on negative making, both in monochrome and in color, brings this information up to date. A section on halftone principles is of particular value. Three-color photography, color separation, and colored inks are dealt with in detail. Special attention is devoted to moire patterns. ("Ilford Manual of Process Work" is published by Ilford, Ltd., London, Price 15S.)

2. Press equipment and accessories

INKING MECHANISM FOR PRINTING PRESSES. Gross Printing Press Company, Ltd. *British Patent No. 581,348.* Viscous inks (e.g., heat-set inks) are fed smoothly and without change of colour by means of an ink fountain in which the fountain roller

is partially immersed in the fountain and a grooved mixing roller is totally immersed in the ink and adapted to rotate in contact with the fountain roller. *Printing Abstracts* 2, No. 1, January, 1947, p. 21.

STATIC-ELECTRICITY INDICATOR. *Instruments* 20, No. 4, April, 1947, p. 320. New "Statometer" is a portable, self-contained electrical instrument designed to aid in study of electrostatic conditions. It is claimed that this instrument, calibrated in terms of static volts, detects fractional-volt static charges, either negative or positive. Provided with a 2-position scale range switch, it measures any voltage from 0 to 750 volts. There are two sockets on top of the instrument in which an air terminal is inserted, one socket for detecting a negative charge and the other for detecting a positive charge. Operation: range switch is turned to low-range position and balanced to zero. As operator approaches a body charged with static electricity, pointer will start to fluctuate. Range switch is then turned to high-range position and, as operator comes closer to charged body, pointer will move up-scale. Instrument weighs 5 lbs. 10 oz., measures 10¾" x 4¾" x 6". Davis Emergency Equipment Company, Inc., 80 Halleck St., Newark 4, New Jersey.

3. Conversion from offset to letterpress

• CONVERTING THE "OFFICE TYPE" PRESS FROM OFFSET TO RELIEF BY MEANS OF THE RUBBER PLATE. *Canadian Printer and Publisher* 56, No. 1, January, 1947, p. 36 (1 page). The steps necessary to accomplish this conversion are as follows: remove damper; remove blanket from blanket roll; mount rubber plate (with adhesive back) directly on the blanket roll or cylinder; put grained plate on plate roll to act as inking roller. Ink goes from regular inking roller to grained plate, then to rubber plate. Job delivers in normal way. No other major adjustments are necessary. Illustrations are given.

4. Electrostatic printing means

MEANS FOR PRINTING. William C. Huebner. *U. S. Patent No. 2,408,144* (September 24, 1946). In printing apparatus, a printing couple comprising a movable member, an image on a surface of said member, and a supporting member arranged in spaced relationship to said image; means electrically insulating said members from each other and from the apparatus, means for moving said first member to bring successive areas of said image into operative correlation with successive areas of print receiving material located between said members and supported by said supporting member, means for inking said image, and means for impelling the ink from said successive image areas to said successive print receiving material areas and comprising an element operatively associated with one of said members but insulated therefrom and a second element operatively associated with the other of said members but insulated therefrom, said elements having a gap therebetween and in which gap said members and material are located, said elements being connected to a source of high potential electric energy whereby said electric energy passes across said gap between said elements and through said members and said material and transfers ink from said

successive image areas to said successive material areas to print the image on said material. *Official Gazette* 590, No. 4, September 24, 1946, p. 614.

Process and Apparatus for Electronic Printing. William C. Huebner. *U. S. Patent Re. No.* 22,869 (April 15, 1947). *Original U. S. Patent No.* 2,224,391 (June 6, 1939). In a printing press having a frame and means for feeding a web of print receiving material, the combination of a hollow impression drum rotatably mounted in the frame; an ink-image-carrying cylinder rotatably mounted on the frame and cooperable with the drum; pressure-creating means within and cooperable with the drum; means within the drum for inducing a field of force at the surface of the drum; and means for selectively positioning either said pressure creating means or the field of force creating means in operative position at the impression zone of the drum and ink-image-carrying cylinder. *Official Gazette* 597, No. 3, April 15, 1947, p. 343, 344.

5. Timing equipment

SIGNALING TIMER. *Chemical and Engineering News* 25, No. 17, April 28, 1947, p. 1215. A signaling timer designed to command visual and audible attention the instant a time interval is completed is said to be versatile in applications in that it provides for the automatic closing or opening of a circuit at the end of elapsed time and operates additional buzzers, bells, or lights at remote locations. The Industrial Timer Corporation, 110 Edison Place, Newark 5, New Jersey is the manufacturer. Operation is on 115 or 230 volts, a.c., 25, 50 or 60 cycles.

6. Air conditioning

*WHAT AIR CONDITIONING CAN DO FOR LITHOGRAPHERS. C. D. Latham. *National Lithographer* 53, No. 9, September, 1946, pp. 30, 31, 70, 72, 76 (5 pages). Quite a few lithographic plants have installed air conditioning equipment to avoid the necessity either for determining weather conditions in the plant and making proper adjustments in processes, or for remedying troubles after they occur. Controlled atmospheric conditions make it possible to gain better control over hygroscopic materials, to predetermine their reactions, and to standardize the procedures of operations. This, in turn, makes possible greater uniformity of product and less substandard work. Air conditioning is excellent for practically all departments in lithographic shops. This article discusses the value of air conditioning in all the various departments in order of value gained. The forthcoming revision of the Lithographic Technical Foundation Handbook of Air Conditioning is to give the lithographer up-to-date information on air conditioning so he will be better able to judge its value and to weigh the merits of the various systems for his own plant.

*AIR CONDITIONING. B. Offen. *Modern Lithography* 14, No. 10, October, 1946, pp. 47, 49, 51 (3 pages). Air conditioning is the processing and treatment of air to maintain a predetermined temperature and relative humidity for a specific area. Effects of temperature and humidity variations upon chemicals, coatings, films, plates, and paper are discussed. The benefits of air conditioning in the following departments are described: photo gallery and dark room, photo composing and transfer department, paper seasoning room, and press room.

The cost of all-year air conditioning is approximated and the factors that affect this cost are considered. Some of the factors involved in deciding on type of air conditioning equipment are listed.

*Converting for Winter. "Harris Impressions" 6, No. 5, September-October, 1946, pp. 2, 3, 4 (3 pages). The various departments of the lithographic shop have many problems during the transition from summer to fall to winter. Along with the change in temperature there is also increased dryness. Development is slower while drying is much faster. Static problems are prevalent in nearly all departments. Adjustments necessary in the other departments, are discussed.

• A SIMPLIFIED CONSTANT HUMIDITY ROOM. James d'A. Clark. *Paper Industry and Paper World* 28, No. 9, December, 1946, pp. 1305-7 (3 pages). In constant humidity rooms, control is usually by wet and dry bulb thermometers, the dry bulb thermostat controlling the final temperature to which the circulating air is heated; the wet bulb thermostat controlling the temperature of the spray water. However, in this simplified system the wet bulb thermostat is replaced by a hair hygrostat, which has the following advantages over the wet bulb control: it is more sensitive; it retains its calibration in a constant humidity room for an indefinite period; and the initial and operating costs are much lower. The construction and arrangement of a constant humidity room are discussed and diagrams are given.

HUMIDIFYING UNIT. Spraying Systems Company. *Chemical Industries* 58, No. 4, April 1946, p. 624. The new industrial humidifying unit produced by Spraying Systems Company introduces a departure from conventional methods in that the entire, compact unit is delivered ready for installation. It is made with two or four nozzle units with humidistat control and the nozzles can be set at various angles to increase efficiency of moisture distribution. Siphon type humidifying nozzles are used which utilize compressed air, mixed externally, producing an exceedingly fine, round (full cone) spray.

7. Adhesives

• HOW TO IDENTIFY ADHESIVES. *Modern Lithographer and Offset Printer* 43, No. 2, February, 1947, p. 36 (1 page). A brief review is given of PATRA's latest publication, "The Identification of Adhesives," Part I. This book describes a series of tests which enables anyone with a minimum of chemical training to identify those adhesives in which water is the main solvent (excluding synthetic resin and rubber emulsions).

• THE FUNDAMENTALS OF TACKINESS AND ADHESION. J. J. Bikerman. *Journal of Colloid Science* 2, No. 1, February, 1947, pp. 163-175 (13 pages). This paper compares the importance of molecular forces with that of rheological forces on different stages of making and breaking adhesive joints.

*Laminating Adhesives and Their Applications. Arthur Biddle. "Paper Trade Journal" 122, No. 23, June 6, 1946, pp. 34-40 (7 pages). The two general classifications of adhesives are: hydrophillics, water absorbing or water soluble glues; and hydrophobics. The formulation, peculiarities, and

functions of the various types of adhesives under these classifications are discussed. Suggestions are given for correct application by laminating machine.

8. Dermititis

PREVENTION OF OCCUPATIONAL DERMATITIS IN LITHOGRAPHY. Louis Schwartz and Leon Goldman. *Lithographic Technical Foundation*, 131 East 39th Street, New York 16, New York. The causes and effects of "chromic poisoning" are described and a list is given of the direct irritants and sensitizers. Tests are set forth to diagnose condition and determine cause of skin rashes. A compilation is made of the best methods of prevention known at this time and instructions are given about what to do if skin breaks out.

*SKIN HAZARDS AND THEIR PREVENTION IN LITHOGRAPHING AND PHOTOENGRAVING. Tibor Benedek. *Lithographer's Journal* 31, No. 1, April, 1946, pp. 8, 51 (2 pages) or *Photo Engraver's Bulletin* 35, No. 10, May, 1946, pp. 35-7 (3 pages). Skin irritants are named. The effectiveness of the following measures in the prevention of dermatitis is discussed: cleanliness, the use of lathering soapless detergents, wearing rubber gloves, and the use of ointments and creams. A list is given of "do's" and "don'ts" to observe.

THE SKIN AND ITS TECHNOLOGICAL HAZARDS. Frank C. Combes. *Colloid Chemistry* 6, 1946, pp. 742-81. Topics considered are: structure and functions of the skin (protection, sensation, temperature regulation, secretion and excretion, absorption); chemical structure; keratinization; metabolism; glandular influences; the skin as an emulsion; response of skin to injury (mechanical, thermal, chemical); biochemical requirements of tissue repair; response of skin to infection; vascular responses (flare, wheal, etc.); inflammation; industrial irritants; cutaneous sensitization and allergies; contactants, sensitizers; skin and patch tests; plant and animal irritants; chemicals (lists), and specific irritants (lists); biologic agents causing or complicating industrial dermatoses (lists); industrial dermatitis and factors involved; diagnosis; varieties other than contact dermatosis; preventive measures. Occupations are listed, together with the hazards involved, and preventive measures are suggested. *Chemical Abstracts* 40, No. 8, April 20, 1946, pp. 2243-4.

9. Technical developments in Germany

*LITHOGRAPHY AS FOUND IN GERMANY. Paul W. Dorst. *Modern Lithography* 14, No. 11, November, 1946, pp. 26-29, 75, 77, 79, 81 (8 pages). German lithographic methods are not greatly different from our own. The same differences of opinion also exist in Germany, as in the United States, on the relative merits of the various printing processes. General information is given on German plates, photography, halftone work, and miscellaneous lithographic techniques and materials. More detailed information is given on the following German techniques and equipment: the "steel plate"; Hausleiter's FOS process (this process produces a positive transparency reading right to left from a positive transparency reading left to

right); silver-gelatin emulsion; film coating method for making "black plates"; metal binding for screens; dye for gelatin films; and non-reflecting coatings. British lithography and French lithography are mentioned briefly.

• LITHOGRAPHY AS FOUND IN GERMANY—Part II. Paul W. Dorst. *Modern Lithography* 14, No. 12, December, 1946, pp. 43, 45, 47, 75 (4 pages). Descriptions are given of diazo processes as found at Kalle and Company, which manufactures Ozalid and other light-sensitive materials using diazo compounds. The diazo compound used in the processes of making transparencies on Astralon and for making litho press plates, costs about twice as much as ammonium bichromate, and is about three times as sensitive to light and the sensitivity to light does not vary with the relative humidity of air with which it is in equilibrium. The manufacture of etched glass halftone screens and gravure screens in Germany is discussed.

• LITHOGRAPHY AS FOUND IN GERMANY, PART III. Paul W. Dorst. *Modern Lithography* 15, No. 1, January, 1947, pp. 43, 45, 46 (3 pages). Photographic equipment, lithographic plates, press work, and mapping techniques as found in Germany are discussed. On the whole, recent German lithographic techniques are not far different from those practiced in the United States; however, some differences in detail do exist.

See II, 15. Part IV.

PHOTO-MAPPING AND MAP REPRODUCTION. Paul W. Dorst. *PB Report 4116*, 1945. 59 pages. (Joint Intelligence Obj. Agency, Report 13). Prices: Microfilm, $1.00—Photostat, $4.00. Contains reports on lithographic techniques developed by F. H. Hausleiter; optical developments by Steinheil Sohne; mthods and facilities for manufacturing halftone and gravure screens in Germany; Diazo processes developed by Kalle and Co. A-G; offset press design and manufacture by Faber and Schleicher A-G; two litho press trailers used by the German army; recent lithographic practices in Germany; German mapping techniques; and target evaluation. Photographs are included. *Bibliography of Scientific and Industrial Reports* 1, No. 8, March 1, 1946, p. 327.

THE GERMAN PRINTING INDUSTRY. A Kirk and others. *PB Report 34044*. 1946. 59 pages. (BIOS Final Report 484, Item 31). Price: Microfilm, $2.00 — Photostat, $4.00. Eighteen printing plants in Germany were visited and their processes, techniques, materials, production systems, machinery developments, etc., are reported with a view to collecting information that might be adopted to advantage by the British printing industry. A detailed summary of the information gathered at each plant is presented in this report. Four items which are considered worthy of emphasis are: (1) The new bimetal process of platemaking by Hausleiter of Munich; (2) the latest modification of deep-etch platemaking methods by Hausleiter and Eggen; (3) the use of Astralon as a base for photolitho original images; and (4) the satisfactory development of color photographs. The report contains reproductions of an illustrated catalogue of photolitho-

graphic equipment, and instructions for "Duxochrom" color printing process and for "EFha" projection printing method for direct projection on offset zinc plates. *Bibliography of Scientific and Industrial Reports*, 2, No. 11, September 13, 1946, p. 829.

• TECHNICAL DEVELOPMENTS FROM GERMANY. *Modern Lithographer and Offset Printer* 43, No. 1, January, 1947, pp. 8, 14 (2 pages). B.I.O.S. Final Report No. 484, Item No. 31, by A. Kirk, Maurice Brown, M. F. L. Kalkner, and H. J. Jarrold, is briefly reviewed. This report covers principally: the new bi-metal process of platemaking by Hausleiter; the latest modifications of deep etch platemaking methods by Hausleiter and Eggen; the use of Astralon as a basis for photo-litho original images; and the development of color photographs.

See I, 17. Color Printing in Germany.

Foundation Publications

TEXTS

Photography

Line Photography for Lithographic Offset
Halftone Photography for Lithographic Offset
Color Separation Photography for Lithographic Offset

Litho Artist's Work (Tone and Color Correction)

Dot Etching
Hand Retouching
Opaquing

Layout and Stripping

Stripping (*Black and White*)
Stripping (*Color*)

Platemaking

Albumin Platemaking
Deep-Etch Platemaking

Press

Lithographic Offset Press Operating (*2 Volumes*)
Press Troubles
Lithographic Offset Press (*Technical*)

General

Chemistry of Lithography
Physics of Lithography
Survey of Lithography
Fundamentals of Lithography
Semi Technical
Estimating (*Black & White*) for Lithography
Estimating (*Color*) for Lithography
Management
Leadership Training
How to Prepare Copy for Lithography

SHOP MANUALS

Paper and Humidity in the Pressroom
Dot Etching
Albumin Platemaking
pH Control of Fountain Solutions
Inking System for Lithographic Offset Press
Lithographic Offset Press Blankets
Feeder and Delivery for Lithographic Offset Press
The Dampening System of the Lithographic Press
Guides, Grippers, and Insertion Devices
Graining for Offset Lithography
Offset Plates in the Pressroom
Line Photography for Lithographic Offset
Lithographic Inks—Drying—Conditioning—Mixing
Packing and Pressures for Offset Lithograph Presses
Press Cylinders for Offset Lithography
Photography for Offset Lithography—Color Separation
Hand Transfers for Offset Lithography
Press Troubles in Offset Lithography
Gauges and Instruments for Offset Lithography
Photo-Composing for Offset Lithography
Tone and Color Correcting for Offset Lithography—Continuous-Tone
Platemaking for Offset Lithography—Deep-Etch
Proving for Offset Lithography
Halftone Photography for Offset Lithography
Paper for Offset Lithography
Paper Conditioning for Offset Lithography

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RESEARCH BULLETINS, TECHNICAL BULLETINS AND MISCELLANEOUS PUBLICATIONS

Research Bulletins

The Characteristics of Paper and Their Relation to Lithography
The Etching Operation in Lithography
The Light Fastness of Lithographic Ink Pigments
Tackiness, Glazing, and Engraving of Offset Blankets
The Albumin Process of Photolithography
Lithotine, a New Lithographic Solvent

Improvements in Deep-Etch Platemaking
Register Studies in Offset Lithography
Reactions of Lithographic Papers to Variations in Humidity and Temperature
Relation of Paper Properties to Register in Offset Lithography
Treatment of Offset Papers for Optimum Register
New Test for Dimensional Changes in Offset Papers
An Experimental Study of Beater Practice in the Manufacture of Offset Papers
Further Experimental Study of Beater Practice in the Manufacture of Offset Papers

Technical Bulletins

Modern Paper-Conditioning Methods and the Paper Hygroscope
Processes for making Deep-Etched Zinc Lithographic Plates by Photo and Hand Transfer Methods
Deep-Etched Aluminum and Zinc Lithographic Plates by the Gum Process
Deep-Etched Lithographic Plates Directly from Negatives
Dot-Etching on Dry Plates and Films
Litho-Kleen, an Improved Cleaner and Preservative for Offset Blankets and Rollers
The Drying of Lithographic Ink

The Inkometer, an Instrument for Measuring the Consistency of Lithographic Inks
Method of Conditioning Paper for Multi-color Offset Printing
Optical Density as a Measure of Tone Values in Lithography

Sales Bulletins

The Paper Hygroscope
The Register Rule

Miscellaneous Publications

Analysis of the Single Color Offset Pressman's Trade
Paper and Paper Problems
Selling Lithography: Unit 1. Creative or Planned Selling
Science of Photolithographic Processes and Materials
Handbook of Air Conditioning for Lithographers

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